

FLIGHT

First Aero Weekly in the World.

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport.

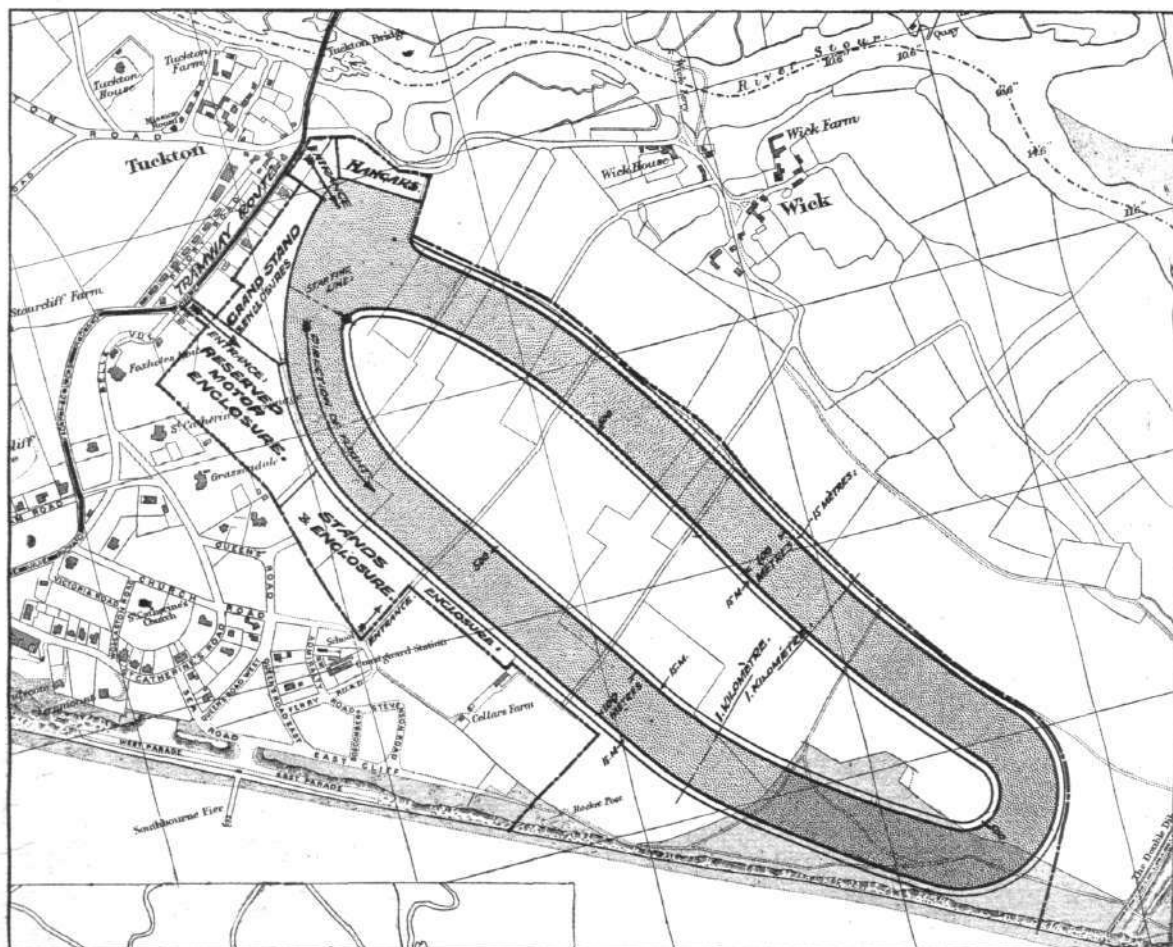
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BOURNEMOUTH INTERNATIONAL FLIGHT MEETING, JULY 11-17.—Plan of the flying grounds.

THE FLYING GROUND DIFFICULTY.

By R. F. MACFIE.

IN view of the fact that many budding aviators are held up for want of a suitable ground to learn on, perhaps my experience in looking for a ground for the last six months may save trouble, time, and expense to those just commencing a similar search.

Before going further let us settle what constitutes a satisfactory flying ground to learn on, with a machine fitted with wheels. These remarks do not apply to Wright machines, which are launched into the air from another machine, and can come down on a ploughed field. To take the average case, we will suppose the aviator has a machine of his own construction which has never yet flown, and that he himself has no experience of actual flying, but proposes to learn on his own machine. We will also suppose he is not a millionaire. In this case he must have a fairly flat ground, smooth enough to ride a motor bicycle over, free from ditches deeper than six inches, bunkers, and soft swampy patches. If it is not smooth enough to ride a motor bicycle over it is very improbable that a flying machine in the hands of an unskilled pilot will develop enough speed to rise unless it be an exceptionally light machine with a very powerful motor such as that of the late M. Delagrangé. Small ditches and soft swampy patches are dangerous for monoplanes of the Blériot type, as if they are running along the ground at 40 miles an hour and come upon a ditch or a sufficiently soft patch suddenly, they will very likely stand on their head or break up in some other way.

Now as to the size of the ground. It is well known that beginners on many of the successful French types of machine frequently take several hundred yards run before being able to rise. The writer was told a few weeks ago by Baron de Caters that when commencing to fly with his Voisin machine, fitted with an 80-h.p. E.N.V. engine, he could seldom rise in less than 500 yards, and often required more, whereas once he had learnt he invariably rose in less than 100 yards. Again, it is fatal for a beginner to attempt a turn until he is a competent straight line flyer. Thus, it would appear that if we are to allow 600 yards to rise in, 300 yards straight flying, 200 yards to slow up in, and a margin, we must have a ground three-quarters of a mile long. As a start should always be made against the wind, the ground should be three-quarters of a mile square, unless we are prepared to wait for windless days, which will be found to be a long wait in England in the winter. Now if a machine like the Voisin, famous for its reliability, fitted with an engine like the E.N.V., which gives a thrust greater than that of any other well-known type of motor, and handled by a beginner who is now noted for the rapidity with which he learnt, can take 500 yards to rise, what must we expect from an average beginner with an untried machine. Evidently three-quarters of a mile square is not too much. For quick rising types such as the "Blériot XI," probably half a mile square would do. Permission to put up a shed or tent at a reasonable rent, or the possibility of renting one, is a necessity, although aviators will probably find it better to take their own tent with them. There must also not be too much wind.

Such a ground as the above is a very difficult thing to find in England in the winter time. In summer time there are many stretches of hard sand where at low tide one can find an excellent practice ground, but in winter

these are nearly always wind-swept, such as the Maplin Sands, near Shoeburyness.

A common argument put forward by flying experts who have never flown is that if a man has enough pluck he can learn to fly on any ground where a flat patch can be found large enough to rise from. Let him start on his flat patch, say these experts, and fly over any obstructions in the way of hedges, ditches, and walls or trees. This method has been tried and found wanting by several people, including the writer. It is not the aviator's body which suffers so much as his pocket. He must be a wealthy man to stand the expense of rebuilding his machine, and, moreover, he won't learn to fly. Making flights of 300 yards is a very different thing to being a competent aviator.

The writer thought that by going to France the ground difficulty would be solved, but there are very many people there who are also held up on account of the ground question. There are only two grounds in France where any appreciable number of beginners have become aviators on wheeled machines in the winter time. One is at Mourmelon, where you have to pay 40 francs a day for a shed. As there is about one possible learning day in eight, the cost is too great for any but rich people. The other ground is at Pau, where an advertisement assures us there are twenty-eight flying days in each month, including Sundays. This ground is so sought after that it is full. M. Blériot's winter school is there, and permission to use it cannot be obtained for people who bring machines of their own construction. There are two other grounds in France, Juvisy and Issy-les-Moulineaux, both very expensive and so wet and windy in the winter that flying is often impossible.

Below I also give a list of grounds in England which have serious disadvantages. In conclusion, I would point out that up to the time of writing only one person has become a successful aviator on a wheeled machine in England—Mr. Cody—and he had the run of the War Office land at Aldershot. All the successful French aviators have learnt under the best conditions of wind and ground. Let those who think that anything is good enough to learn on remember that "experience is a hard school, but fools will learn in no other."

List of Grounds in France.

Issy-les-Moulineaux.—A cavalry drill-ground in a suburb of Paris. Flying only permitted between 4 and 7 a.m. and 5 and 7 p.m. Hangars expensive and ground often wet, and windy in the winter. Would take a beginner a long time in the winter to become proficient owing to circumscribed hours and adverse conditions. Competent aviators on proved machines frequently are unable to leave the ground. Rougier was recently unable to leave the ground on Voisin machine fitted with Rougier engine, giving a thrust of 425 lbs.

Juvisy.—Twenty-five minutes by train from Paris. Hangars 20 louis first month, 16 louis a month afterwards. Ground generally soft and difficult to rise from in the winter. Eight or ten weeks ago a boat was being used to ferry aviators from one side of the ground to the other. Recently flooded, and many machines totally submerged.

Mourmelon.—In Camp d'Auvours, Chalons, near Rheims, cavalry drill-ground. Hangars 40 francs a day. Splendid ground, but frequently windy in the winter

time. About one learner's flying day per week, so the expense is great.

Pau.—Two grounds belonging to municipality. Wright and Blériot Schools. Individuals with their own make of machines not wanted. Splendid ground and weather in winter.

Nice.—A new aerodrome has been started here, but it is reported small and rough. Little wind.

Croix d'Hins.—Near Bordeaux. A large space, 6 kilometres square, has been cleared of scrub and trees. A dug and levelled track has been put round the ground, but owing to the steam roller not having arrived up to a few weeks ago this was so soft that sufficient speed was impossible. The centre part is impossibly rough except in small patches, roots and stumps still remaining. The late M. Delagrangé was, up till recently, the only aviator able to get off the ground here this winter, owing to his very short run and powerful engine. Impossible for learners at present. Generally good weather in the winter time. The management here are exceedingly hospitable and courteous, placing sheds at the disposal of aviators free of charge, unloading their machines for them, and giving them every help.

List of British Grounds.

Brooklands.—Sheds £10 per month or £100 per annum, including right to use interior of track except when race meetings are in progress.

Wembley.—Too much money and not enough ground. £5 a week was asked for use of ground alone. Use of shed extra but not quoted.

Park Royal.—Not enough smooth ground to learn on.

Hounslow Heath.—Long wait getting permission from War Office. Difficulties housing machine.

Hendon.—Very promising; not yet ready.

Wormwood Scrubbs.—Difficulties getting permission. This applies also to nearly all grounds controlled by the War Office, Borough Councils, and the Jockey Club.

Fambridge, Essex.—Late colony of British aircraft. Now abandoned as a flying centre. Not enough smooth ground, too many drainage ditches, about 6 ft. deep or 12 ft. broad.

Large field opposite side river; from Fambridge 3 miles by 1½. Too many drainage ditches intersecting.

Rochford, Essex.—Several large fields, over a mile square, recently meadow land, now ploughed up.

Large Fields near Southend.—Now under cultivation.

Maplin Sands, Essex.—Foulness, near Shoeburyness; finest natural aerodrome in England. For 8 hours out of 12 there is 10 miles by 4 of very hard sand. Too much wind in winter, tide dangerous, and War Office does not permit; otherwise perfect.

Camber Sands near Rye, Sussex.—Two miles by one at low tide of fairly hard sand, with numbers of very soft patches which might cause monoplanes of the Blériot type to stand on their heads, but it is probable some good long runs could be obtained. Long rigmarole involving references, &c., to rent a plot of land to put up a shed. Address Major Neal, Rolvenden.

The grounds of the Royal Aero Club at **Shellbeach** and **Eastchurch** are, of course, only open for use to members of the Club.



THE PILCHER GLIDER.

MR. LAURENCE W. MILLER, from Calexico, California, sends us some important facts in regard to the actual cause of the disaster to the late Mr. Pilcher, which have an interest in themselves, in addition to their being a record in the "history" of flight and its martyrs. Mr. Miller writes as follows:—

"In your issue dated 8th January I read with interest your article on the late Mr. Pilcher's glider. You state, however, that it was the main beam of his machine which gave way during his last glide. This was not the case, as the cause of his fatal fall was due to the

snapping of one of the bamboos supporting the tail-piece, or rudder. The *Daily Graphic* reported it in these words: 'Then a sharp gust of wind came, and the tail of the apparatus snapped.' I was myself present, and was one of the first to go to Mr. Pilcher's assistance, as he fell practically at my feet. I worked on the reconstruction of his machine for a year previous to his accident, and made under his directions the biplane type of machine which he was to have tried on the day he met his death. It is not generally known, I think, that Mr. Pilcher had his engine at his works all ready. I am glad to see that Mr. Pilcher's name has not been forgotten, and by this time I think it has been proved that his experiments were not in vain, though the final cost was so great."



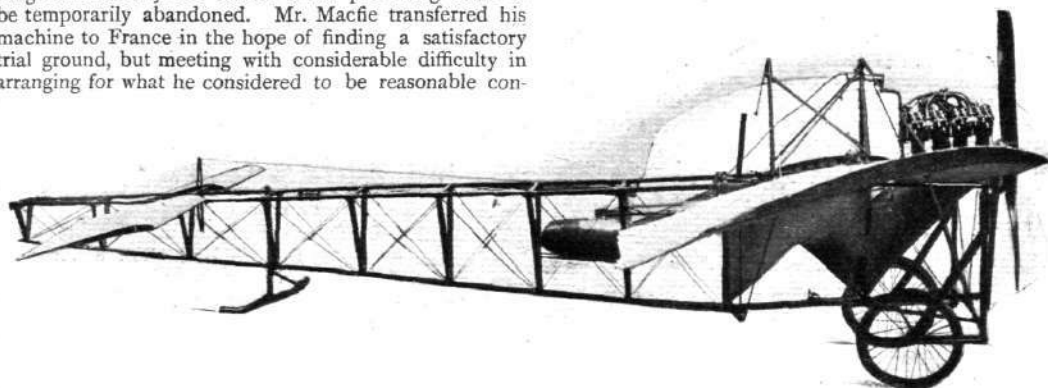
Huntingdon Old Race Course, which it is proposed to utilise as a permanent aviation ground, as seen from the railway. The recent phenomenal rains have been the cause of unusual flooding of the meadows.

THE MACFIE BRITISH AEROPLANE.

SOME little time ago, as our readers may remember, flight experiments were carried out on the Maplin Sands by Mr. Macfie, who succeeded in making a few long jumps before the military authorities in charge of the gunnery range at Shoeburyness caused these promising trials to be temporarily abandoned. Mr. Macfie transferred his machine to France in the hope of finding a satisfactory trial ground, but meeting with considerable difficulty in arranging for what he considered to be reasonable con-

The Frame.

The frame of the machine is a light V-section ash girder measuring about 3 ft. deep at the forward end and 12 ins. deep at the tail. The bottom member lies



Side view of the Macfie monoplane.

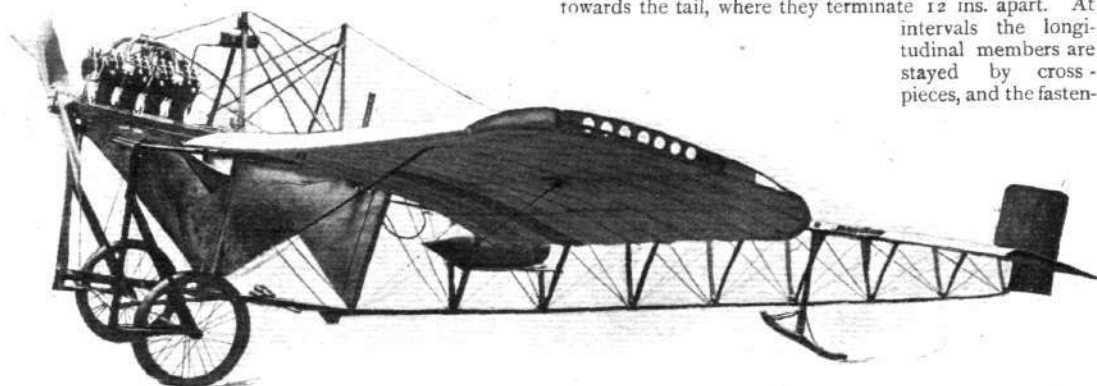
"Flight" Copyright.

ditions under which he could continue his experiments, he has once more returned to England, and is now about to conduct further trials over home soil.

The Macfie aeroplane is interesting as an almost entirely home-made machine, and also because it embodies several ingenious features in the details of its construction. As a type it resembles at first sight the Blériot monoplane, but the wings have a dihedral angle like the Antoinette.

horizontal when the machine is on the ground, and the two top members, therefore, have a gradual slope from the tail to the forward end of the machine. The front extremity of the frame is formed by a kind of prow that is specially constructed as a support for the engine, pains having been taken to try and reduce the effect of vibration as much as possible.

The two upper members of the frame are spaced about 2 ft. 6 ins. apart at the widest point, which is immediately between the wings, and they likewise taper together towards the tail, where they terminate 12 ins. apart. At intervals the longitudinal members are stayed by cross-pieces, and the fasten-



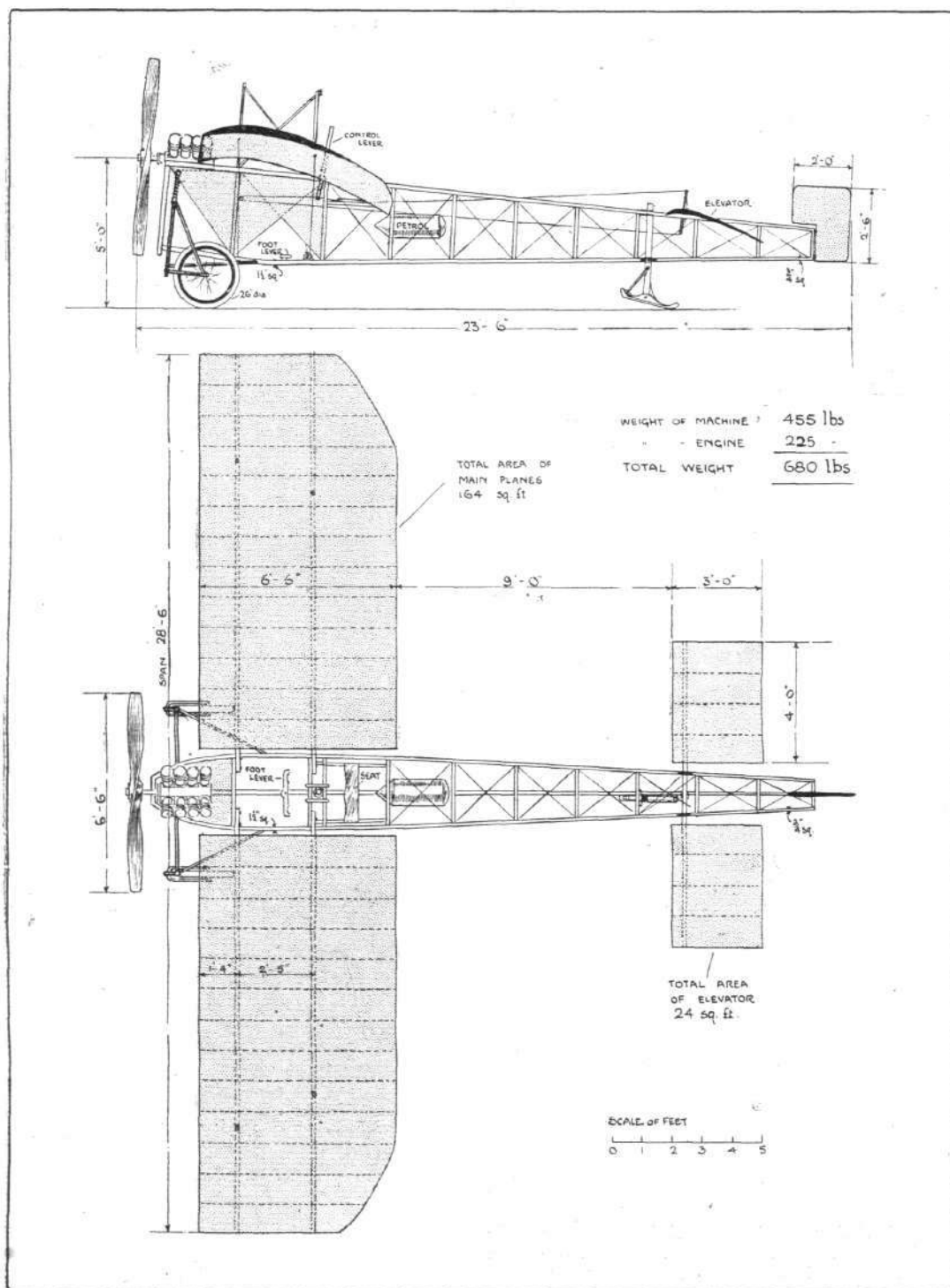
View of the Macfie monoplane from in front.

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They are fastened to a frame that is built of wood and wire and forms a V-section lattice girder of tapering section. In front, the frame is mounted on a wheeled chassis, and behind it rests upon a skid. The rear part of the frame carries a pivoted tail and a rudder. In front, immediately above the chassis, is the engine, which drives a two-bladed tractor-screw. The pilot's seat is between the wings, and the control, which includes wing-warping, is effected by a single vertical lever and a pedal.

ing of these is one of those peculiarities, it might almost be said curiosities, in the constructional detail of the Macfie aeroplane. An accompanying sketch shows exactly how the joints are made.

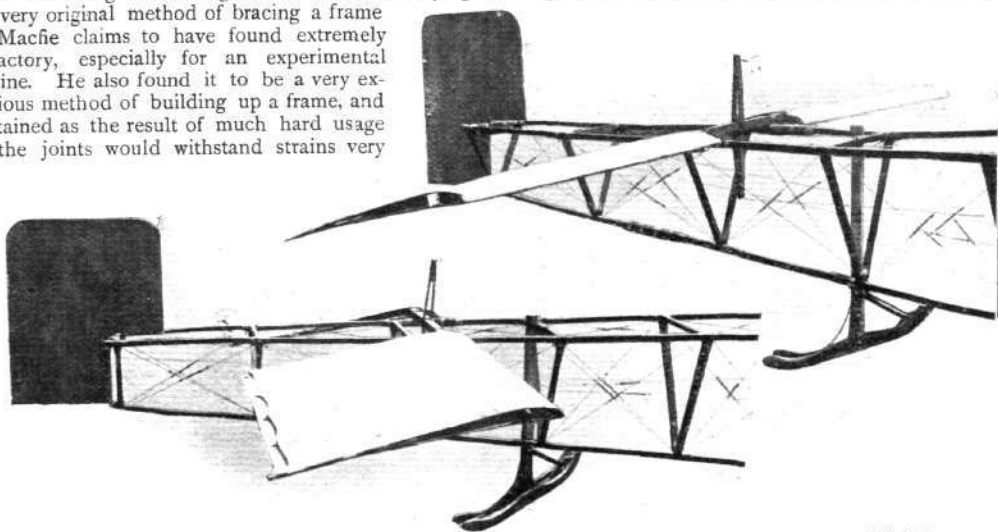
The girder struts abut flat and true against the bearer spars, but they do not make any sort of a mortice joint. Their fastening is effected by the use of steel angle-plates that are lashed to the different members by strips of fine Irish linen tape. The tape is previously soaked in a



The Macfie Aeroplane.

solution of glue and water and is bound in place while wet, so that the binding contracts tight and hardens while drying. This very original method of bracing a frame Mr. Macfie claims to have found extremely satisfactory, especially for an experimental machine. He also found it to be a very expeditious method of building up a frame, and ascertained as the result of much hard usage that the joints would withstand strains very

tie-wires used to complete the trussing of the frame. Close inspection of the accompanying sketch already referred



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Two views of the tail on the Macfie monoplane. The tail consists of an elevating plane and a rudder.

well indeed. Moreover, if one should loosen it is a simple matter to remake it, for the component parts, with the exception of the binding, are intact. When screws or bolts are used in any joint of this description they are apt to spoil the wood



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View of the two-wheeled chassis that supports the fore part of the Macfie monoplane.

so much if they work loose that it is difficult to remake the joint in exactly the same place. This is, of course, one of the principal claims that Mr. Macfie makes for his system of construction.

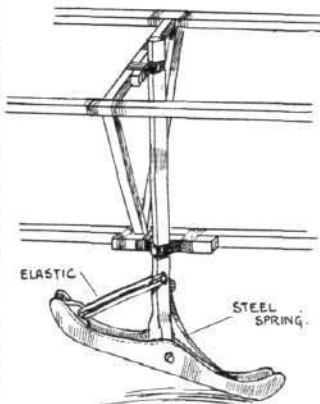
An incidental feature associated with this method of jointing is the anchorage that it provides for the diagonal

to will show that the steel angle-plate is indented at the corner, so as to receive a steel pin. The angle-plate is also drilled so that the centre of the pin, which is cranked, can project through to the front, where it forms an eye for the anchorage of the tie-wire.

The same system of binding, it may be remarked, is also employed for joining together the two lengths that compose each of the longitudinal spars of the main frame.

In front the frame is supported on a wheeled chassis constructed of steel tubing. The details of this chassis are sufficiently clearly shown

by one of the accompanying photographs to need no special description. It will be observed that, in the main, it consists of a rectangular frame, to the upright members of which the two wheels are attached by swivel brackets. There are two forked brackets to each wheel, and one of them abuts against a helical compression spring situated near the top of the vertical member in the chassis frame. These springs form the suspension members of the machine, and enable the wheels to rise and fall vertically without interfering in any way with the swivelling movement. The hubs of the wheels are connected by a light axle that is hinged at each end. At the rear the frame is supported on a light shoe or skid shown in the sketch above.



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Sketch showing the mounting of the skid that supports the tail end of the Macfie monoplane.

(To be concluded.)

HOW A BIRD LEARNED TO FLY.

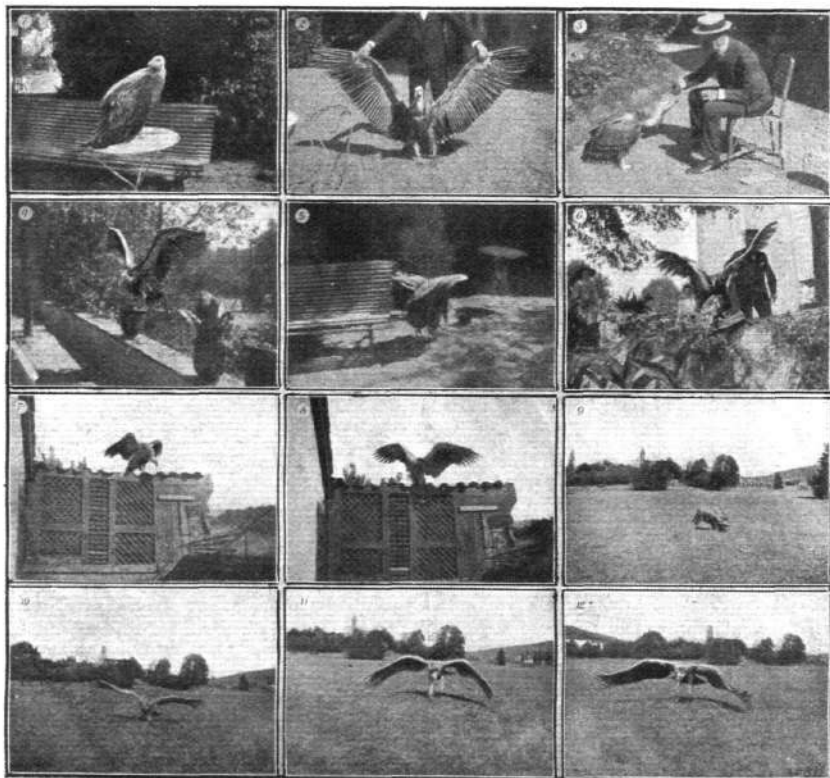
JUST how far a bird needs to learn to fly under really natural conditions is a matter which might perhaps tax even the patience of a naturalist to definitely prove. But that a young vulture in captivity found much practice necessary in order to master the art is demonstrated by the following interesting story which the well-known French aviator, the late Captain Ferber, who was fatally injured last year when flying, originally contributed to our contemporary, *Omnia* :—

Some time ago, said Capt. Ferber, his friend Capt. Detroyat, wrote to him: "My brother-in-law, M. Sala,

and if he flies it will show that his instinct suffices. If he does not fly it will be plain that he needs a rational course of instruction."

"Captain Detroyat did as recommended, and the result of his observations is as follows :—

"Photos 1 and 2 were taken on the 15th of September, when the vulture, who answers to the high-sounding name of 'Coco,' weighed 9 kilograms, and measured 2.2 metres from tip to tip of his wings, with a maximum width of .5 metre. This is approximately a square metre of surface. According to the shepherds who brought him



FLYING.—Lessons from the vulture. The series of efforts of "Coco," the baby vulture, in his endeavours to acquire the art of flying. The several pictures shown above are dealt with in detail in our accompanying article on this page.

and myself have just succeeded in catching a young vulture in the Pyrenees. He is less than six months old, and the spread of his wings is already 2.2 metres. But he is quite unable to fly, and he is not even come to the point of progressing by flighty jumps. What shall we do? Shall we tie a string round his neck, and train him on Archdeacon's principle by towing from a motor boat, or shall we push him into the air from the 'pylon' of the Aero Club?" "I replied," said Captain Ferber, "as follows :—'The case is a most interesting one, and I should imagine that what is the matter with the bird is that he has not had an opportunity of being taught by his parents. You be his father and photograph his attempts. But don't tie him to a motor boat. It might be bad for his health. You might push him off the roof,

in, and by plotting out a curve of the rate at which his weight increased, it was probable that the date of his birth fell in the previous April. He is unable to fly, and can hardly toddle.

"'Coco' is not altogether wild (photo No. 3). Indeed, he is so little wild that it is impossible to frighten him enough to make him run. At the end of September he tried his wings several times, very much like a recruit going through his 'extension motions,' on the top of a pot full of flowers (Fig. 4) to the very great damage of the latter, but without daring to fly to the ground. One day he was sufficiently venturesome to attempt gliding from the top of a table or seat with his wings spread out like a parachute (Fig. 5). After that his progress was made by practising flying jumps. This period was very long. In

spite of the efforts of his adopted father, he could not be induced to start and practise gliding from the top of a 2-metre wall which surrounded a field. He was so unenterprising that he was finally pushed off a roof, but to everyone's great surprise it was then found that 'Coco' really *could* not fly (Fig. 6). He fell like a lump after having spread his wings in a vague and undetermined sort of way. I was unable to believe that this was really the case, so I tried again. The second time he fell head down on the gravel just about five metres from the spot vertically under the point at which he started. Unfortunate bird! I heartily begged his pardon, for he was really very much afraid, and in consequence he had a heart attack and was very ill the whole evening afterwards.

"By the 4th of October he was getting on nicely, and was practising from the top of a hen-house (Figs. 7 and 8), where he tried his wings for a long time, and ultimately glided down from the eminence to a distance of 15 metres, where he landed like a big chicken. Next he was taken out into the middle of a big field without trees and incited to run like Santos Dumont at Bagatelle, during which time he got gradually more courageous (Fig. 9).

"He commenced by jumping on his feet and beating his wings at the same time (Fig. 10). These jumps became more frequent, and increased in length and speed without greatly increasing his height according as the speed he got up permitted (Fig. 11), till finally he got up sufficient speed in his last jump to leave the ground definitely, and to continue gliding along at 1½ metres above the surface (Fig. 12). In this way he covered 30 metres at the run, and then 100 to 150 metres

flying, exactly like Santos Dumont. He had come to the point at which he was proceeding from flight to flight.

"Another series of experiments which he carried out consisted of jumping into the air 3 or 4 metres. To induce him to do this, we placed him in a small yard which was walled in on three sides by buildings, the fourth being closed up by a wall of 2½ metres in height. He disliked remaining in this little courtyard, and, after two or three jumps and beating with his wings, he succeeded in rising high enough to get on the top of the wall, from which he glided down into the field. How did he get out of this narrow space when he found it so difficult to rise from the ground in an open field? Possibly some current of air between the buildings assisted him, or perhaps necessity made his efforts more violent. The point has not been decided.

"Finally, on the 13th of October, he had become a 'master.' He flew 200 or 300 metres through the air and returned to his point of departure, *i.e.*, his pen, without allowing himself to be tempted away by his wild brothers in the mountains. At this date he weighed 10 kilogs., while the stretch of his wings was 2·55 metres. Gradually his absences from home increased in length, but he always came back without becoming in any way wilder.

"Unfortunately, he had not the dread of mankind possessed by his wild brothers of the mountains, and one of those brutes with a gun, who must kill everything they can get near, succeeded in approaching him as he was sitting on a rock, thinking no harm of anyone, and shot him dead. The 'sportsman' was rather astonished on approaching the dead vulture to find a rose-coloured ribbon round his neck."

THE "G. AND J." BIPLANE.

FOLLOWING upon his experiences with the Voisin "Bird of Passage" and various other machines of different types, Mr. A. E. George has just had built at the Newcastle works of George and Jobling a new biplane which somewhat resembles the Curtiss type. It, however, embodies several improvements, which have been designed by Mr. George as a result of his experience.

The total sustaining area of the machine, including tail, elevator, and ailerons, is 438 sq. ft., and the total weight is 660 lbs. The single 9-ft. propeller is driven at 600 revs. per min. by means of a 2 to 1 chain transmission

from an 80-h.p. 4-cylinder Green engine, and gives a thrust of 500 lbs.

The patent triplicate control system is one of the main features. This is composed of a steering wheel placed vertically and actuates the rudder, elevator, warping tips, and ailerons, all of which can be done by one hand, and each movement does not interfere with any other.

The chassis, which is of steel tubing, has patent spring supporting wheels and landing skids. The radiator tubes are so placed as to form part of the lower supporting surface.

Progress and Prospects of the Gyroscope.

IMPOSSIBLE as it is at present to realise the extent to which gyroscopic control may or may not be found useful or even invaluable in connection with motor-driven flyers of any or every kind, yet no student of aeronautical matters can afford to ignore any progress that is being made in that direction. As yet, Mr. Louis Brennan, C.B., of torpedo fame, has made this important subject more particularly his own than any other living man, it having occupied years of experiment and research on his part.

The system evolved by him has chiefly been applied to his mono-rail system of transport, and the very latest of his experimental vehicles was shown in operation to a large party of engineers and pressmen at his Gillingham factory on Friday of last week. Full particulars of the Brennan system, as far as it is at present known, are given in the *Auto.* of this week.

Municipal Encouragement in Austria.

THE Municipal Council of Vienna have voted a sum of £20,000 for the management of the Steinfelder flying ground.

A Large Hall Wanted.

THE Aeronautical Society of Great Britain has appointed a Laboratory Committee to investigate various questions of interest to aeronauts. Some of the work to be carried out will necessitate the use, from time to time, of a room or hall of considerable dimensions, and the Society will be glad to hear from anyone who may be willing to assist the Committee by placing accommodation at their disposal. It being of great national importance that work of this kind should be carried out in this country without delay, it is hoped that this appeal of the oldest aeronautical society in the world will meet with an immediate and generous response.

AIRSHIPS IN PEACE AND WAR.

By R. P. HEARNE.

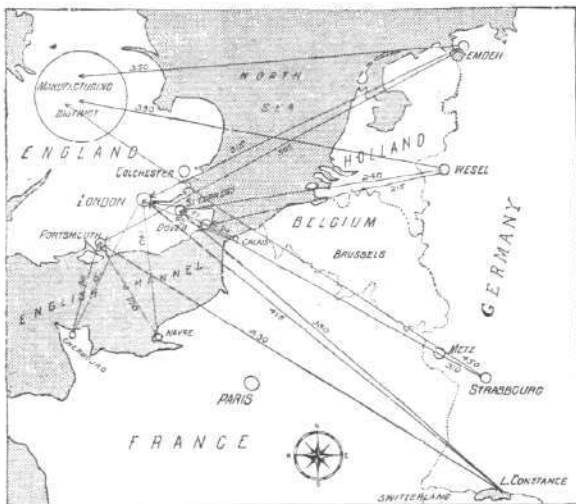
IN issuing a second edition of "Aerial Warfare" the author has taken advantage of the opportunity to change the title to that given above. Although less than half

strategical diagrams accompanying the Aerial Warfare section of the book are specially novel features; one relating to England we reproduce, as well as another which applies to an imaginary country. These are more than usually appropriate at the present time when it is fashionable to be scared at the very word "airship," and perhaps our readers may be interested in the following abstract from Mr. Hearne's book:—

"Now, if we glance at the diagram, it will be noted that a straight run of 380 miles would take the Zeppelin from Lake Constance to Sheerness, one of our important naval centres, in less than thirteen hours, if an average speed of thirty miles an hour were kept up. If she chose to attack, we have absolutely nothing that could stop her.

"She would travel over Germany, France, the Channel, and England during the night without the least fear of detection, and could strike with literally the suddenness of a bolt from the blue. Our forts and warships are not designed to fight aerial attackers. Indeed, without special high-angle guns, worked by specially-trained crews, and firing high-explosive shells, we could offer hardly any resistance. And, even if by any good chance such an attacker were brought down eventually, it could certainly get in its blow first. It could do enormous damage, it could send invaluable wireless messages back to head-quarters, and then, if destroyed by chance, it would mean but the loss of a vessel costing, say, £20,000, and the lives of a few men. A torpedo-boat attack would cost more in lives and cash value of vessels destroyed, and it certainly could not effect so much.

"An airship of the modern type is practically an invisible



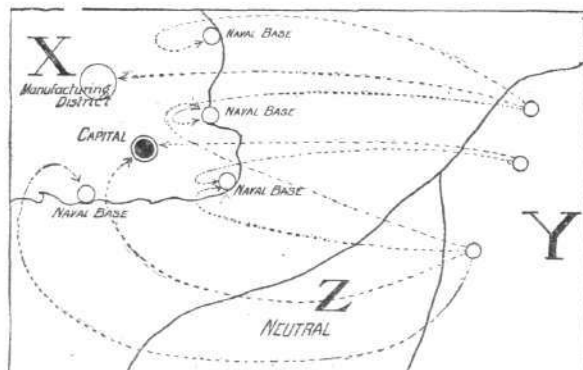
CAN ENGLAND BE RAIDED?—A map showing distances from the principal strategic points of France and Germany to the English capital and naval bases. Reproduced from the latest work on flight by Mr. R. P. Hearne.

this book deals directly with the original title subject, the remainder, which is history, is so attractively compiled, and has been so conscientiously brought up-to-date, both with regard to airships and aeroplanes, that we can unhesitatingly draw our readers' attention to the publication as one which they would do well to acquire.

The study of warfare in general is one associated with the especial province of a very few civilian experts outside the usual military schools, but as the author of the present volume modestly refrains from introducing himself—and as, moreover, Sir Hiram S. Maxim is far too busy expressing his own views on flight to be bothered with performing this courtesy in the special introduction which he has written to the work in question—the reader is left in some doubt as to the exact point of view from which Mr. R. P. Hearne has investigated the subject. Apparently, from a perusal of the book, it is rather that of the dilettante than the soldier, and incidentally that, too, of one who labours under the very typically British depression caused by this nation's apparent sluggishness in keeping up with the times. Apart from this special aspect of the case, however, the work should make interesting reading for those who like to obtain a concrete idea of possible future developments, and as the author says what he has to say in clear and simple language, those who peruse its pages can very quickly grasp the leading points brought forward.

One of the features of the book is the number of illustrations which it contains, and these without exception are admirably reproduced. The series of

* John Lane. 7s. 6d. net.



War between a Continental nation, Y, and an insular power, X, the former using airships. Reproduced from "Airships in Peace and War."

enemy, it has greater speed than any warship, and, as it can pursue almost a straight line, it can get from point to point, over either land or water, more rapidly than any other form of military or naval locomotive. The upper air is free to all, and a German airship could take its line across France or any other country without protest. In fact, it would probably never be seen, and this matter of invisible attack is the most terrifying feature of aerial warfare."

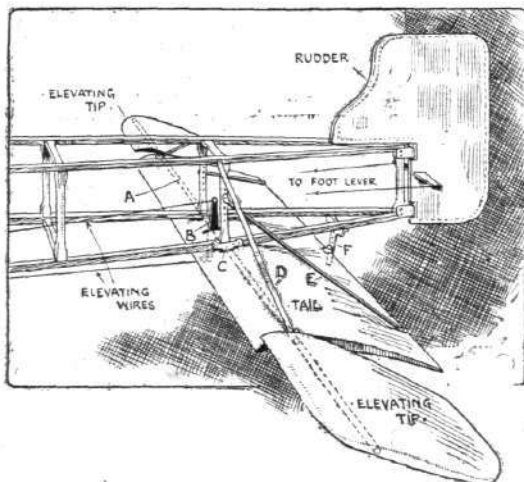
The several chapters added to this new edition include those giving brief illustrated descriptions of the leading types of aeroplanes, and dealing with the principal flying meetings of last season.

FURTHER DETAILS OF THE BLÉRIOT CROSS-CHANNEL FLYER.

WE have prepared the accompanying sketches primarily in order to answer certain points raised by a correspondent, F. W. Bramley, whose letter appears this week. There has been so much correspondence about

bracket, F, is similarly made adjustable for the same purpose.

The operation of the elevating tips, which are movable at either extremity of the central tail plane, is effected by

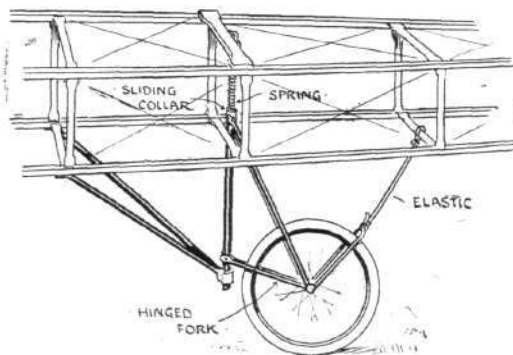


this machine, however, that the following remarks relating to the details in question will doubtless have a wider interest. We have consequently thought proper to deal with them in this form.

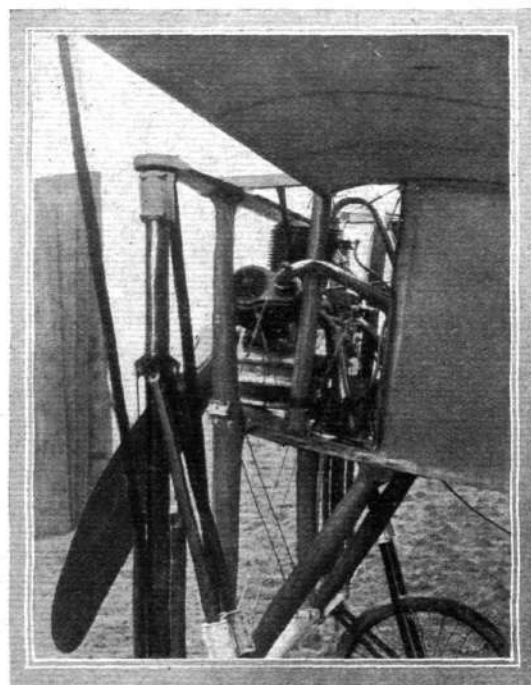
One of the two sketches shown herewith represents the wheel at the rear of the chassis. The diameter of this wheel has not previously been given; it measures 20 ins. An interesting minor detail to which attention may be drawn in connection with the arrangement of this wheel is the use of a piece of elastic anchoring the wheel bracket to the chassis frame. The fork that carries the wheel is pivoted to a vertical post that is trussed substantially to the chassis frame. In addition to this pivotal motion the forks are also hinged and mounted in such a way that they afford a spring suspension. The spring is situated at the top of the vertical post in the position illustrated by the sketch. The object of the elastic is, of course, to keep the wheel in line ready for landing, but at the same time it does not interfere with the free swivelling of the wheel when the machine is running along the ground.

The other sketch shows in very complete detail the construction and arrangement of the tail on the Blériot cross-Channel flyer. It affords answers to all the questions raised by our correspondent. The tail is supported on a steel tube, A, by aluminium brackets, C, clamped to the main spars of the frame. The steel tube forming the main transverse member of the tail is trussed by a flat strip steel tie-bar, B, that extends from the top of the main frame to the junction of the tail with the elevating tips.

Further support for the tail is afforded by the diagonal struts, E, made of light steel tubes that pass from the trailing edge of the tail plane to vertical uprights in the main frame of the chassis. This latter attachment is so arranged as to afford an adjustment whereby the angle of incidence of the tail can be varied. The small perforated



means of the main transverse tubular spar, A. The elevating tips are fixed to this spar, as also is the central lever, B, that is connected by wires to the operating lever under the pilot's control. The main spar, A, can, of course, rock in its bracket. The central portion of the tail plane is not movable in flight, but can be adjusted as already described.



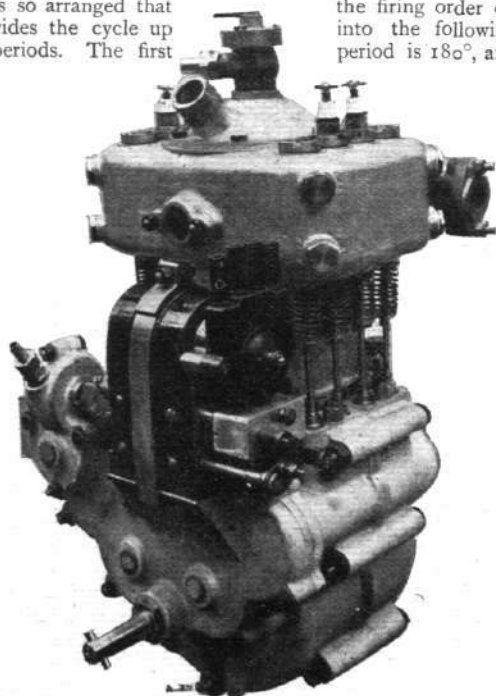
The above illustration shows an interesting portion of the Blériot monoplane at close quarters. It is one of Mr. Claude Graham-White's machines that is now being experimented with by Mr. R. W. A. Brewer.

THE ASTER FLIGHT ENGINE.

A GLANCE at the accompanying photographs reveals what is apparently a twin-cylinder motor of unusual breadth; in reality the illustration represents a 4-cyl. engine which is remarkably short. The design in question is the work of the Aster Company, and it has been applied to a 12-h.p. model (bore and stroke 80×100 mm.) which they have recently placed on the market. There is, as the photographs show, only one crank-shaft, and the peculiarity of the system lies in the fact that the cylinders are bored on oblique axes, so that in reality they lie V fashion in pairs; the cylinder casting, however, has the external appearance of a vertical engine. The connecting-rods are coupled in pairs to two cranks, which are set 180° apart, an arrangement which is analogous to an ordinary 4-cyl. engine. In the case of the Aster engine, however, the sequence of the cylinders is quite different from that of a 4-cyl. engine, for one transverse pair represents cylinders Nos. 2 and 3 on an ordinary 4-cyl. engine, while the other pair represents cylinders Nos. 1 and 4. The firing order follows the usual sequence of a 4-cyl. engine, the impulse being received by the two cranks alternately, as in a 2-cyl. engine.

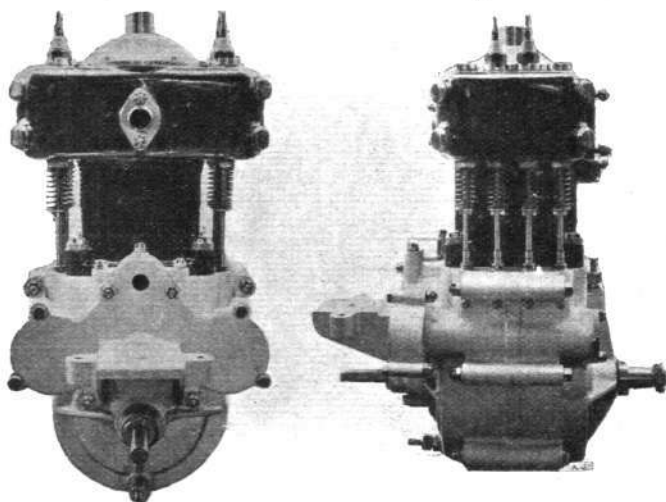
An explosion occurs every stroke, as with a 4-cyl. engine, but the oblique position of the pistons upsets the evenness of the periods between the explosions, that is to say, the dead centre of one piston occurs a little before (exactly 15°) the dead centre of the other piston, which is coupled to the same crank-pin, and there is consequently this difference between the points at which the two explosions take place. The wiring is so arranged that the firing order divides the cycle up periods. The first

place. The wiring the firing order divides the cycle up periods. The first



View of the 4-cyl. Aster. The cylinders are arranged V fashion, and cast en bloc.

represents the transference of working stroke from one cylinder to, say, that immediately behind it in the longitudinal plane. The second period is 195° , and represents the transference of the working stroke to the



THE ASTER FLIGHT ENGINE.—End and side views of the new motor, which has the appearance of a twin-cylinder engine, but in reality has four cylinders arranged obliquely in pairs. The pistons are connected to a two-throw crank-shaft.

cylinder which is diagonally opposite that last in action. It is here assumed that the sequence is being considered in the same sense as the engine rotates, and that the crank-shaft, therefore, has to make up 15° leeway before it brings the next piston into its firing position. The third period in the cycle is another of 180° because the working stroke merely passes to the adjacent cylinder in the longitudinal plane, but the forth and last period in the cycle is only 165° , inasmuch as in transferring the working stroke diagonally once more to the opposite pair, there has this time been a gain of 15° on the crank-shaft in the operation, and the firing point for that piston will be reached correspondingly early. Although it might be expected that this discrepancy would be noticeable compared with the best results obtainable from a well-balanced 4-cyl. engine of the ordinary type, it must not be overlooked that a 2-cyl. motor is commonly designed to run with extremely unequal intervals, a period of 180° being followed by another of 540° , and it is as a substitute for the twin-cylinder engine that the model has been designed. A more serious difficulty would appear to be the working of the ignition from a magneto, but even a battery circuit would, of course, require some form of specially synchronised contact-breaker in the primary circuit, in addition to a special spacing of the distributor quadrants.

There is also a constructional difficulty in an engine of this type, which might not at first sight be foreseen, and that is the necessity of making provision for the pistons to clear one another when the cylinders are lifted. In this operation the effect is to bring the connecting-rods gradually together like the blades of a pair of scissors, until finally the trunks of the pistons overlap before they can be drawn clear. In order to allow for this, part of

one of the pistons is shaped to form a recess for the other.

This same operation also involves specially shaping the connecting-rods so that they can close together to the necessary extent, and a further difficulty has apparently been found in getting an adequate bearing surface for the big-ends, there being two of them on the same crank-pin. This latter has resulted in a special design, whereby the forked big-end is bushed with a thick yellow metal sleeve, which extends between the forks, and thus entirely surrounds the whole of the crank-pin.

It is upon this sleeve that the knuckle-ended connecting-rod takes its bearing. A peculiarity which has automatically resulted from the oblique arrangement of the cylinders, which is deserving of special attention, although no particular claim is made in connection with it by the manufacturers, is the disposition of the valve-chambers in respect to the combustion spaces; the inclined cylinder and the vertical valve producing an arrangement which was a special feature of the Coventry-Daimler engines preceding the advent of the "Silent Knight."

LANGLEY MEDAL PRESENTED TO WRIGHT BROS.

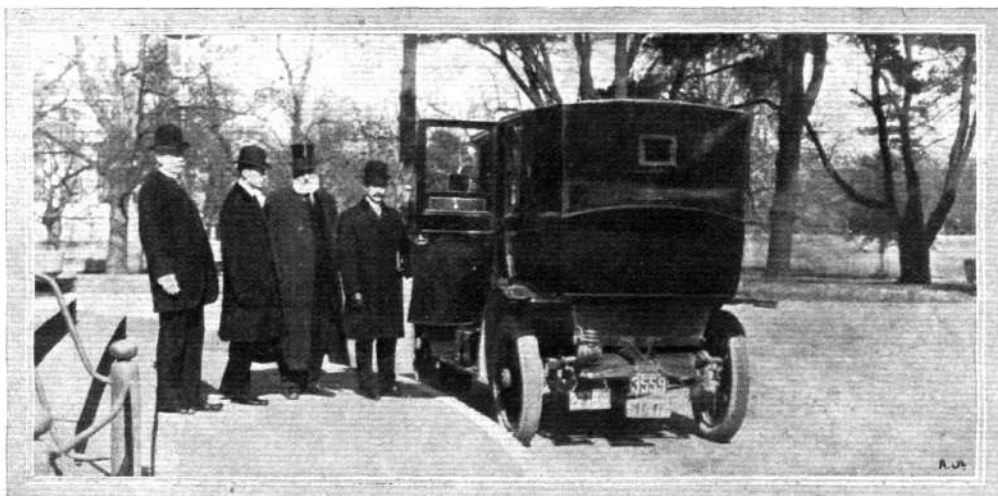
It will be remembered that last December the Board of Regents of the Smithsonian Institution—the British Museum of America—decided, on the suggestion of Dr. Graham Bell, to commemorate the aeronautic research work of Langley, who was for many years Secretary of the Institution, by founding a medal to be awarded for specially meritorious investigations in connection with the science of aviation. The first Langley Medal was given to Wilbur and Orville Wright on February 10th, and in the accompanying photograph the Brothers Wright are seen at Washington after the presentation. The Hon. Melville W. Fuller, Chief Justice of the U.S. and Chancellor of the Institution,

presided at the meeting, and gave the medals, while the other Regents present included the Hon. Jas. S. Sherman, Vice-President of the U.S., Senators S. M. Cullon, H. C. Lodge, and Aug. O. Bacon. A most stirring address on the value of Langley's work was given by Dr. Graham Bell, and in the modest speech of thanks by Wilbur Wright he said that his brother and himself had made extensive investigations with regard to the co-efficient of air pressure, and although they had had

to lay this work aside for a time on account of more pressing business matters, they hoped to be able to take it up again in the near future and to present the results to the world.



THE FIRST LANGLEY MEDAL.—Presented by the Smithsonian Institution to the Bros. Wright.



The Wright Bros. leaving the Smithsonian Institution after the Presentation of the Langley Medal.—
1, Secretary Chas. D. Walcott. 2, Mr. Wilbur Wright. 3, Dr. A. Graham Bell. 4, Mr. Orville Wright.

MY EARLY EXPERIMENTS.

By SIR HIRAM MAXIM.

It is now about seventeen years since I first commenced my experiments at Baldwin's Park. It then appeared to me that it would be possible to make a flying machine that would lift itself in the air, with a steam engine and boiler for motive power.

I had previously had some experience in building light and active steam engines, and also light boilers; but at that time there were no reliable data regarding the action of screws or aeroplanes on the air.

True, a good many systems of aerial navigation had been suggested, but no real work had been done.

After a good deal of study and experiment it was evident to me that the best possible system, and the one that offered the greatest chance of success, was that now known as the "aeroplane," which, at that time, I referred to as my "steam kite."

As I went on with my experiments, it appeared that it would be better to have more than one aeroplane. I therefore made my machine with two, that is, a "biplane."

At first, I intended to use only 100-h.p. with a steam pressure of 150 lbs. per sq. inch, with two screw propellers 17 ft. 11 ins. in diameter, and 24 ft. pitch. When, however, I tried my machine by running it along the track, I found that a good deal more than 100-h.p. would be required. I found, however, when I only used 100-h.p. that I could condense all the steam and recover the water; but 100-h.p. was not enough. I then made a change. I constructed a stronger boiler with a forced circulation, and a new pair of screws, the same diameter as the others, but having a pitch of only 15 ft.

All of these screws were made of wood, glued up in the ordinary way, after the manner of making patterns for marine screws, and this has turned out to be the very best form of screw, as witnessed by the fact that nearly everyone at the present time is using this kind of screw.

By running my engine faster, and by greatly increasing the steam pressure, I actually ran the power up to 362-h.p. This was the actual power delivered by the screw on the air. Of course, the indicated horse-power would be a good deal more.

Under this great pressure, the screw thrust was found to be considerably over 2,000 lbs., that is, each of the screws gave a thrust of over 1,000 lbs.

The machine was 105 ft. wide, and there was not room enough at Baldwin's Park to test it, but I devised a plan by which I could measure its lifting effect. I laid down a steel railway 1,800 ft. in length, 9 ft. gauge, and another one outside and over this, of 35 ft. gauge. The machine was mounted on light steel wheels, but was free to lift off the wheels and the axletrees, but when the whole weight of the machine was sustained by the aeroplanes, another set of wheels engaged the lower side of the upper track, so that the machine was really running on an inverted railway. A very carefully constructed dynamograph was so arranged and connected that a diagram of the lift was taken on each run, and it was found that with a screw thrust of, say, 1,500 lbs., the machine would lift off the steel rails, after having

run about 300 ft., when all the other wheels would engage the upper track. This showed most conclusively that the whole weight of the machine was carried by the aeroplanes.

On one occasion the machine was tied up and the steam turned on, until a screw thrust of over 2,000 lbs. was obtained; upon letting go, the machine bounded forward with tremendous speed, and when it had run a distance of about 600 feet the lifting effect became so great that one of the axletrees of the upper wheels doubled up, and the other side of the machine lifted so forcibly that it broke the upper track, which was of Georgia pine, 3 ins. x 9 ins.

When the machine was liberated it soared in the air, and gave us the feeling of being in a boat, but it was only for a few seconds, because the Georgia pine plank was raised in the air and came in contact with one of the screws, and this not only smashed the screw itself, but did great damage to the machine. Steam was shut off instantly, and the machine settled down in the soft turf. There were no marks on the greensward, consequently it was very evident that the machine was drawn into position, but settled down directly. Photographs of this are now in existence.

Upon going into the matter carefully it was found that the machine, at the time of breaking the axletree and the upper rail, must have been lifting fully 10,000 lbs., including its own weight, or, say, 2,000 lbs. over and above the weight of the machine, the three men on board, the water, and the petrol. This, of course, is not a large amount, when we consider the h.p. that was employed.

At the time of the accident the engines must have been working up to more than 400 indicated h.p.

It was only too evident to me at the time that it would be very dangerous to attempt free flight without first trying the machine on relatively level ground, where there was plenty of room, and I scoured the country from Tunbridge Wells to Reading, trying to find a suitable place which I could obtain at a reasonable price, but failed to do so.

Still, the experiments went far enough to show that a machine could be made that would lift itself into the air. Of that, there could be no question. But such a machine was absolutely of no value, on account of the enormous quantity of water that was required. It takes a lot of water to run a 360-h.p. high-pressure engine, and I could not condense more than one-third of this water. I therefore decided to abandon the steam engine, and to devote all my attention to building a machine having an internal-combustion engine.

I made sketches, and ordered the cranks; these were made by Whitworth, and I think that they are quite as fine a piece of workmanship as ever has been done in crank making, being of remarkable lightness, finely tempered, and highly finished. But the ground at Baldwin's Park was required for a public institution, and I had to leave; this was followed by an attack of bronchitis, and the whole thing had to be abandoned for a time.

Henry Farman Building a Monoplane.

HAVING produced a biplane, with which such extraordinary success has been attained, Mr. Henry Farman

has determined not to stop there, but is now busily engaged in building a monoplane, with which it is expected he will soon be seen making experiments.

ROYAL AERO CLUB OF THE UNITED KINGDOM.

OFFICIAL NOTICES TO MEMBERS.

Annual General Meeting.

The Annual General Meeting of the members of the Royal Aero Club of the United Kingdom will be held on Thursday, March 10th, 1910, at 5 o'clock, at 166, Piccadilly, London, W.

Committee.

In accordance with the rules, the Committee shall consist of eighteen members. Members are elected to serve for two years, half the Committee retiring annually. Retiring members are eligible for re-election.

The following members have been nominated :—

R. M. Balston.	P. Harrington Edwards.
Major Sir A. Bannerman, Bart., R.E.	Philip Gardner.
Ernest C. Bucknall.	V. Ker-Seymer.
F. Hedges Butler.	E. Gordon Lennox.
Vice-Admiral Sir Charles Campbell, K.C.M.G., C.B., D.S.O.	E. Manville.
Col. J. E. Capper, C.B., R.E.	J. T. C. Moore-Brabazon.
Major-General Cummins, C.B., D.S.O.	Hon. C. S. Rolls.
Martin Dale.	Sir Charles D. Rose, Bart.
	A. Mortimer Singer.
	Hon. A. Stanley, M.P.
	R. W. Wallace, K.C.

Ballot papers for the election of nine candidates to seats on the Committee have been issued to Members.

No ballot paper which is signed, or on which the number of candidates voted for is more or less than the number of vacancies, or which is received at the Club later than 12 noon on Wednesday, March 9th, 1910, will be valid.

Committee Attendances during the Past Year.

Meetings held, 47.

Name.	Attendances.	Name.	Attendances.
Griffith Brewer	15	Earl of Hardwicke	11
E. C. Bucknall	41	Prof. A. K. Huntington	38
Sir Chas. Campbell, K.C.M.G., C.B., D.S.O.	9	V. Ker-Seymer	32
Col. J. E. Capper, C.B., R.E.	11	F. K. McClean	24
Maj. C. de W. Crookshank, R.E.	3	J. T. C. Moore-Brabazon	28
Martin Dale	44	C. F. Pollock	37
John Dunville	16	Hon. C. S. Rolls	33
Capt. A. H. W. Grubb, D.S.O., R.E.	4	J. Lyons Sampson	20
		Stanley Spooner	40
		Roger W. Wallace, K.C.	45

Committee Meeting.

A meeting of the Committee was held on Tuesday, the 1st inst., when there were present :—Mr. R. W. Wallace, K.C., in the chair, Mr. Ernest C. Bucknall, Major C. de W. Crookshank, R.E., Mr. Martin Dale, Professor A. K. Huntington, Mr. V. Ker-Seymer, Mr. C. F. Pollock, Hon. C. S. Rolls, Mr. J. Lyons Sampson, Mr. Stanley Spooner, and joint secretaries, Capt. E. Claremont, R.N., and Harold E. Perrin.

New Members.—The following new members were elected :—

Albert Batchelor.	Major F. H. Pigou.
B. Blackburn.	Basil Reyner.
Arthur Q. Cooper.	E. W. Wakefield.
Hermann F. Moll.	G. Stanley White.
Edwin Rowland Moon.	

Aero Exhibition at Olympia.

The Aero Exhibition at Olympia, held by the Society of Motor Manufacturers under the auspices of the Royal Aero Club of the United Kingdom, will open on Friday, the 11th March, terminating on Saturday, the 19th. Members of the Royal Aero Club will be admitted free on production of their membership cards. A room in the Princes Gallery will be placed at the disposal of the members during the Exhibition.

The exhibit of the Royal Aero Club will include the machine of Mr. J. T. C. Moore-Brabazon, with which he won the circular mile flight prize of £1,000; a Wright machine, on which the Hon. C. S. Rolls has made many flights; a monoplane, the property of Mr. B. Nicholson; and a French biplane, recently acquired by the Hon. C. S. Rolls.

Long Distance Balloon Record.

As soon as the weather permits, an attempt will be made to secure the long distance record. A balloon has been specially constructed with a capacity of 163,000 cu. ft., by Mr. A. E.

Gaudron, who will be the pilot. The passengers, who are all Members of the Club, will be Capt. E. M. Maitland, Mr. A. C. Hunter, Mr. W. H. M. Pattison and Mr. R. A. Collingwood. It is hoped that a start will be made from the Crystal Palace on or about the 10th inst.

Michelin Cup.

Mr. J. T. C. Moore-Brabazon, on Tuesday last, made a flight of 18½ miles at the Club grounds at Eastchurch, in connection with the Michelin competition for a cup of the value of £500. The competition for the year closes on March 31st next, and the prizes will be awarded to the aviator who accomplishes the longest distance on an all-British machine.

Pictures and Books.

Mr. V. Ker-Seymer has presented to the Library "Record of Motor Racing," by Mr. Gerald Rose, and Mr. Omer-Decugis, of Paris, an album of photographs of Paris taken from a balloon.

Pictures have been received from Miss Rennie, Mr. Montague Dixon, and the President of the Swiss Aero Club.

Royal Aero Club and Doncaster.

In view of the incorrect statements which have been given to the Press, the following is a copy of the correspondence which passed, and which speaks for itself :—

"9th February, 1910.

"DEAR SIR,—We enclose herewith copy of a communication we have received from Mr. C. Bellamy and Mr. G. W. Saynor, of St. George's Chambers, St. George's Gate, Doncaster. This communication was brought before our Committee last evening, and we have been instructed to say that if a formal application was received from the Doncaster Corporation the same would be most carefully considered by our Committee.

"We also beg to send you a copy of our reply to Messrs. Bellamy and Saynor.

"Yours faithfully,

(Signed) "E. CLAREMONT, } Joint Secretaries.
"HAROLD E. PERRIN, }

"The Town Clerk, Town Hall, Doncaster."

"Doncaster, February 3rd, 1910.

"To The Aero Club of Great Britain and Ireland.

"We learn through the official paper of the Aero Club (FLIGHT) that you are arranging for two aviation meetings in England during this year, and as yet you state no town has been selected for either. Now, if this is the case, why not hold one in this, our town of Doncaster? In our opinion, and in the opinion of several of the well-known aviators who flew here during the aviation week of last year, the ground and surroundings make it the most suitable spot in England for such a meeting, and what must also be taken into consideration are the railway facilities. Doncaster is one of the most central towns in England, and can be reached quickly and easily from practically anywhere in Great Britain, the train service being excellent.

"Then with regard to the attitude of the Aero Club on last year's meeting. The officials of Doncaster could not postpone their meeting last year, because practically all arrangements were made before it was definitely known that Blackpool was to have a meeting, or that the Aero Club would not give its sanction. Apart from this, the week following the meeting was fixed for an annual race meeting, which, as you know, could not on any account be put off. Therefore you will understand it was impossible to postpone the meeting.

"The attitude of the Aero Club caused a great deal of comment, which has done neither Doncaster nor the Aero Club any good, though the general public sided with Doncaster, seeing in what an awkward position the officials were placed.

"Therefore, taking all things into consideration, what better could be done to clear up the misunderstanding than for the Aero Club to withdraw its ban, and to try and arrange for a meeting here, say, some time in August? This would remove the barrier which was placed on aviation when first practically introduced into Great Britain; it would give an additional enthusiasm towards this new sport and commercial enterprise, and would also tend to obtain the support of the whole of the British public (a great number of whom have so held aloof from this science since the misunderstanding of last year) on the side of the Aero Club, in its efforts for the furthering of aviation in Great Britain.

(Signed) "C. BELLAMY.

"GEO. WM. SAYNOR."

9th February, 1910.

"DEAR SIR,—We submitted your letter of the 3rd inst. to our Committee last evening. We presume it is the intention to hold the Aviation Meeting on the Doncaster Racecourse, which we understand is the property of the Doncaster Corporation. Our Committee therefore consider that any application for an Aviation Meeting should be made by the Doncaster Corporation. We have taken the liberty of forwarding a copy of your communication, together with this reply, to the Town Clerk of Doncaster.

"Yours faithfully,
(Signed) "E. CLAREMONT,
"HAROLD E. PERRIN, } Joint Secretaries.

"Messrs. C. Bellamy and G. W. Saynor, St. George's Chambers, St. George's Gate, Doncaster."

February 12th, 1910.

"DEAR SIR,—I am in receipt of your letter of the 9th inst., enclosing copy of recent correspondence between Messrs. Bellamy and Saynor and yourself regarding a suggested Aviation Meeting this year at Doncaster.

"My Corporation know nothing of these persons. I will, however, lay your letter before my Council at their next meeting. After the attempt unsuccessfully made last autumn to practically ruin the success of the first Aviation Meeting in England, my Corporation will not, I think, have occasion to enlist the distinguished patronage of your Aero Club this year.

"Yours truly,
(Signed) R. A. H. TOVEY, Town Clerk.
"The Secretary, Aero Club."

14th February, 1910.

"DEAR SIR,—We beg to acknowledge receipt of your letter of the 12th inst. Our sole object in writing you was that, having received a letter purporting to come from responsible persons in Doncaster, and being desirous of treating you with courtesy in the matter, we thought you would like to know what was being done. We regret very much to find that you should think fit to reply in a letter which we can only consider as impertinent. We trust that, as you are placing our previous letter before your Committee, that

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you will also place your reply thereto together with this communication.

"Yours faithfully,
(Signed) "E. CLAREMONT,
"HAROLD E. PERRIN, } Joint Secretaries.

"R. A. H. Tovey, Esq., Town Clerk's Office, Doncaster."

16th February, 1910.

"DEAR SIR,—We are instructed by our committee to forward you a copy of the correspondence which has taken place between us and your Town Clerk, Mr. Tovey. Our only wish in writing was to show every courtesy and consideration to the Town of Doncaster, as the gentlemen who wrote to us about the proposed meeting seemed to infer they did so in the name of the town. We are somewhat surprised, therefore, at receiving a letter from the Town Clerk which we can only consider as most discourteous—in fact, impertinent.

"With many regrets for troubling you,
"Believe us to remain,
"Yours faithfully,
(Signed) "E. CLAREMONT,
"HAROLD E. PERRIN, } Joint Secretaries.

"The Mayor of Doncaster, Town Hall, Doncaster."

"Town Clerk's Office, Doncaster,

February 25th, 1910.

"DEAR SIR,—Your letter of the 9th inst., with enclosures, together with my reply of the 12th inst., and also your further letter to me of the 14th inst., were all read at a meeting of my Council this afternoon, and I am desired to state that the Council approve the letter which I wrote to you on the 12th inst., and resolved that the whole of the correspondence be laid on the table.

"Yours faithfully,
(Signed) "R. A. H. TOVEY, Town Clerk.
"The Secretary, Aero Club."

E. CLAREMONT, CAPT. R.N.,
HAROLD E. PERRIN,
Joint Secretaries.

166, Piccadilly.

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PROGRESS OF FLIGHT ABOUT THE COUNTRY.

(NOTE.—Addresses, temporary or permanent, follow in each case the names of the clubs, where communications of our readers can be addressed direct to the Secretary. We would ask Club Secretaries in future to see that the notes regarding their Clubs reach the Editor of FLIGHT, 44, St. Martin's Lane, London, W.C., by 12 noon on Wednesday at latest.)

Aviation Association of Ireland (HOTEL METROPOLE, DUBLIN).

A COMMITTEE meeting of the above Association was held the other day, at which a discussion was arranged for March 8th, at eight o'clock, at the Royal College of Science, Dublin.

The President, Mr. J. B. Dunlop, will take the chair and has kindly consented to open. The subject for discussion will be "Gliders," and a good discussion is expected, as several members have already promised to speak.

The best thanks of the Association have been conveyed to Mr. F. F. C. Trench, who, owing to illness and stress of work, asked the committee to accept his resignation. Mr. Trench has done a lot of work for the Association, being one of the founders, and well deserves the thanks of all members.

Members are reminded that they are allowed to bring a visitor.

Birmingham Aero Club (165, HAMPTON STREET).

THE Hon. Secretary, Mr. F. A. Thompson, writes as follows:—

"As Birmingham's enthusiasts have unfortunately been so slow in constructing full-sized machines, and the fact that we have no flying men in this great mechanical city, have all served to stimulate the following.

"I have already suggested locally that those gentlemen, who can afford, will subscribe the necessary funds for an aeroplane, and entrust the construction with the members of the Birmingham Aero Club.

"We have many capable members to undertake such a task, and the construction of such a machine, built and financed by Birmingham citizens and a Birmingham club, from materials obtained in Birmingham, should it prove a success, would be a great incentive to individual enterprise.

"One thing that is needed in this city for the encouragement of such an important science and industry is someone to take the initiative—someone to make a start—and I am certain the rest will follow.

"The Birmingham Aero Club are willing to undertake the work of construction, but are unable to finance same.

"If Birmingham's citizens will subscribe the necessary funds towards the development and education of their city, they can rely upon every possible practical assistance from the members of the Birmingham Aero Club."

Bristol and West of England Ae.C. (STAR LIFE BLDGS., BRISTOL).

IN presiding at the inaugural meeting of the Bristol and West of England Aero Club, at the Grand Hotel, Bristol, Sir George White, Bart., said he was pleased to see that the club had already been formed, and he hoped that a large membership would soon be obtained, which would enable the objects of the club to be realised. Sir George White further remarked that the club would be placed very advantageously, inasmuch as they would obtain from his company all the help they would be enabled to give from the undertaking they were contemplating carrying out in connection with aviation.

Sir George White was unanimously elected President of the Club, and in accepting the position reiterated that he would be very pleased to do all he could to further the interest of the Club.

Kite-Flying Association (27, VICTORY ROAD, WIMBLEDON).

IN presiding at the annual meeting of the Kite-Flying Association, Major Baden-Powell congratulated the members on the success attained during their first year. It was decided to alter the name of the Association to the Kite and Model Aeroplane Association, and it was announced that a prize fund would be started for competition, while an exhibition is also being organised. A paper, by Mr. W. R. Dines, was read in his absence, on "Kite Flying at Pyrtton Hill," the official station of the Meteorological Office for the investigation of the upper air. Kites were sent up about three times a week, carrying a meteorograph that left a record of temperature, humidity, and wind velocity, results being obtained up to a height of 3,300 ft. There was great room for improvement in the construction and design of kites, and the question was of much practical interest, for there were points of similarity between a kite and an aeroplane, and knowledge of the one must react on the other. For mathematical investigation of stability a perfectly uniform air motion,

or one varying according to some fixed law, must be assumed, actual wind being unsteady, and the assumption must be opposed to actual facts, except in the case of a dead calm. Progress must come chiefly from experiment, which he would like to see taken seriously in hand.

With reference to the note in our last issue, that Mr. Patrick Y. Alexander had been nominated as a vice-president, this gentleman writes to say that he has declined the office.

Midland Aero Club (GRAND HOTEL, BIRMINGHAM).

UNDER the auspices of this club, a meeting was held in the Birmingham Town Hall on Friday of last week, when Major Baden-Powell delivered a lecture on the national importance of aviation. In the absence of Sir Alfred Hickman, through illness, Mr. Ebenezer Parkes, M.P., took the chair.

In the course of his lecture Major Baden-Powell pointed out that there was a great deal to discover with regard to aeroplanes, and at present we were but on the threshold of the development of really practical flying machines. What was wanted were larger machines. They must rise from the ground easier; they must be more stable, more portable, and generally very much more reliable. He advised inventors to go on experimenting and making small models. All military authorities, he said, were agreed that the aeroplane would be of very great importance, from the military point of view, if we could get a machine which would really do all he had outlined, and be able to skim through the air without any tendency to tumble over, capable of carrying two or three people, and perhaps a gun. If such a machine were fairly vulnerable then it would have to be turned out, not by ones or two, but by hundreds and even thousands. When we got to that stage, from the military point of view alone we should at once get a very large industry, and

he looked forward to the day when he could come down to Birmingham and go over one of the factories for the manufacture of aerial machines for military purposes. This was not the only object of such machines. As long as they were fairly safe, and fairly cheap, they would be very greatly used by a great number of people for sport and pleasure. Therefore another industry would develop which would be of very great importance. There was the more serious matter of instituting regular services between one place and another, in which these machines were likely to develop to a greater extent than any balloon, since they were bound to be less dependent upon the weather and cheaper to construct. They would become a very cheap and rapid method of travel.

Northumberland Ae.C. (ROYAL TURK'S HEAD, NEW-ON-TYNE).

ON Monday last a large number of members paid a visit to Messrs. George and Jobling's garage, to view a new biplane of the Curtiss type which has been built in Newcastle for Mr. A. E. George. It is fitted with an 80-h.p. engine. On the 16th inst. a paper will be read on "Aviation," by Mr. David Balfour, jun., in the Club Room at the Royal Turk's Head Hotel.

S.W. Aeronautical Soc. (51, ST. LEONARD'S ROAD, EAST SHEEN).

As many gentlemen have asked to see the monoplane now almost complete at the Aeroworks, Down Place, King Street, Hammersmith, arrangements have been made for it to be on view to-day, Saturday, March 5th, from 3.30 p.m. to 8 p.m. The Hon. Sec. will explain the machine to all who care to accept the invitation. At intervals, a successful model petrol engine, 3-h.p., with 18-in. Cochrane propeller attached, will be shown running.

WRIGHT BROTHERS AND THEIR PATENTS.

THE strong action taken by the Wright Brothers in connection with their patents, apparently seems to be working to the detriment of flying in America, and an injunction has been secured against Paulhan, which will prevent him flying either on his Henry Farman or Blériot machines unless an indemnity, fixed by the judge at £5,000, is paid into Court. In order to allow him to fulfil certain engagements this injunction will not become operative until the 12th inst. At present the Courts seem to favourably incline towards the Wright patent,

therefore it is possible that the United States may be at the beginning of another long legal wrangle similar to that which has dragged on for years over the Selden patent.

With regard to the Gordon-Bennett Cup, the Wright Brothers announce that they will not take any action against machines imported purely for the purpose of taking part in the International competition, only insisting upon the payment of a nominal fee to uphold their rights.

MODEL COMPETITION AT GODALMING.

LAST month a model aeroplane competition was held at Hill Side School, Godalming, prizes having been offered by Mr. R. W. Buttemer and Mr. F. S. Poole for the best model constructed during the Christmas holidays. Eight models, two of which were biplanes, were entered, and Mr. J. Lyons Sampson acted as judge, the results

being decided on constructional merit and actual performance, the latter, it may be said, being somewhat marked by lack of horse-power to contend with the wind. The monoplanes scored in the event, G. Cursham being the winner, and E. Elles second. Our photographs, sent by Mr. Buttemer, are a pleasant record of the meeting.



Launching a model.

G. Cursham, 1st prize. E. Elles, 2nd prize.

Judging the flights.

A MODEL AEROPLANE COMPETITION AT HILLSIDE, GODALMING.

AVIATION NEWS OF THE WEEK.

Flying at Eastchurch.

ON Friday of last week the Hon. C. S. Rolls made a flight of a quarter of an hour's duration, traversing about ten miles on his Short-Wright machine. During this trip, made at Eastchurch, Mr. Rolls ventured to higher altitudes than he has ever previously attained.

In a trial for the British Michelin Cup on Tuesday, Mr. Moore-Brabazon flew at Eastchurch for 31 mins., covering about 18½ miles on his Short machine.

Flying at Bradford.

A SHORT spell of calm weather on Sunday last induced Mr. John House to have a trial with the Blériot monoplane purchased by the Northern Aero Syndicate at Blackpool, and two successful flights were made at the Apperly Bridge Ground, Bradford. At the first attempt Mr. House rose some five or six feet from the ground, and travelled between 300 and 400 yards before he descended. In the second flight the height reached was about 20 feet, but, unfortunately, in descending a slight mishap occurred as one of the wheels stuck in a hole in the ground, causing the machine to overturn. Mr. House escaped without injury, but the propeller was smashed, and other slight damage done to the framework.

Flying Ground at Bradford.

MR. A. HOUSE, of the Northern Aero Syndicate, writes to say that they will be pleased to make arrangements with anyone in the North to share in their ground at Apperley Bridge, Bradford. The ground is five-eighths of a mile in length, with only a low wall, and that if necessary could be partly taken down and replaced by a movable fence.

Mr. A. V. Roe Back at Brooklands.

MR. A. V. ROE has now left Wembley and is once more back at Brooklands, where, it will be remembered, he conducted his earliest experiments, although at that time there were no special facilities for flying.

Another Apt Farman Pupil.

IT is astonishing how easily some of the purchasers of Farman machines seem to learn the art of flying, M. Geo. Chavez, the well known French "Soccer"

football player, recently took delivery of his Henry Farman machine at Chalons, and on the 28th ult. he had his sixth lesson and flew alone for close upon two hours. Starting soon after nine o'clock, he rose to a height of about 60 metres, and maintaining that altitude flew over the country around Chalons until his petrol supply ran out, when he landed safely just as the clock was striking eleven, having been flying for 1 hour 47 minutes.

Kuller Flies in a Gale.

KULLER, who has succeeded Latham as the Antoinette instructor at Chalons, although he has not made any lengthy flights, yet certainly seems to have caught the daring spirit of his master. On Sunday last he made two sensational flights in the teeth of a wind blowing at the rate of nearly 34 miles an hour.

Rougier at Monte Carlo.

AT the beginning of the week, Rougier arrived at Monte Carlo, and announced that he hoped to give public exhibitions during the week, and would attempt to fly round Cap Martin and back.

Doings at Pau.

ON the 24th, the delegate of the French Minister of War visited Pau to witness trials of the Blériot monoplane destined for the Army. M. Blériot conducted the tests himself, and in spite of the strong wind blowing, he flew once round the track, stopped and started again immediately, and then flew for 20 minutes. In the afternoon he was out again and made a sensational landing by gliding down from a height of 50 metres.

Capt. Engelhardt at Geneva.

ON the 25th ult., by his flight of three miles on his Wright flyer over the frozen lake at St. Moritz, Capt. Engelhardt was the first aviator to make a long flight in Switzerland.

Lieut. Calderara Out Again.

HAVING got his machine completely repaired, Lieut. Calderara was flying again at Centocelle on the 23rd ult. A stiff wind was blowing, but the officer flew several times round the camp, and then rising higher the



Another view of Old Huntington Race Course where it is proposed to create an aviation ground.

interesting spectacle was seen of an aeroplane flying over the old Roman aqueduct. After this flight Lieut. Calderara gave up his seat to Lieut. Savoia, who made his first solo flight of about ten minutes.

A Novel Biplane.

ON the new biplane which has been designed and built by MM. Guyot and Verdier, and with which they will shortly be conducting trials at Le Dorat, the propeller will be placed in front, where it will be driven by a 60-h.p. E.N.V. motor.

Ae.C.F. Doings.

IT has recently been decided by the Ae.C.F. that they will recognise in France the pilots' certificates issued by the Kaiserlicher Aero Club of Germany as equal to those of the Aero Club of France.

Pilote-aviateur certificates have recently been granted to M. Effimoff and M. A. Chavoz, while M. André Schelcher has been given a pilote-aeronaut's certificate.

A sub-committee has been appointed to draw up the regulations for a competition for parachutes for aeroplanes. A sum of 5,000 francs has been placed at the disposal of the committee for prizes for this competition.

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AIRSHIP NEWS.

Parseval Excursions from Munich.

THE garage which the Parseval Aerial Navigation Company is building at Munich will be 75 metres long, 38 metres wide, and 25 metres high. This will accommodate the two airships which are to be engaged in the passenger services during the coming summer. The fare for the daily excursions in the neighbourhood of Munich has been fixed at £11 per person, while for the longer excursion to the Bavarian Alps the fare will be £25 each.

The New "Parsevals."

"PARSEVAL NO. V," which is much smaller than any of the others, being of only 1,200 cubic metres capacity, made a successful trial trip on the 25th ult. at Bitterfeld, and "Parseval IV" has also been out making tests with a new electrical signalling system, from which good results are said to have been obtained.

Three other craft of this type are under construction at the Bitterfeld works. Nos. "VI" and "VII," which are destined for the passenger services at Munich, will soon be completed, while No. "VIII" is being built for the Brussels Exhibition.

"Zeppelin III" in Dry Dock.

IN order that certain parts of the steering gear, &c., may be remodelled, "Zeppelin III" has been dismantled and the framework separated into two sections to facilitate the work of transporting this huge structure.

An All-Steel Dirigible.

AFTER working at the problem for ten years, a young Austrian officer, Lieut. Halboun, is said to have perfected a system by which he is able to construct the envelopes of dirigibles of thin leaves of steel so arranged that they are gastight. The invention also includes an arrangement by which the altitude of the machine can be varied at the will of the pilot without using ballast. A public subscription has been opened to allow of a full-sized machine being built and tested.

An Aero Club for Norway.

NORWAY at last has a national Aero Club, which has been formed at Christiania, with Mr. H. Mohn, the well-known meteorologist, as President, and Lieut. Gen. W. Olsson as Vice-President. Application has been made to the Fédération Aéronautique Internationale for recognition as representing Norway.

An Altitude Prize.

A PRIZE has been offered at Nice, under rather novel conditions, by M. Bartol, who is spending the winter on the Riviera. The Cup, which is of a value of 5,000 frs., will be given to the first aviator who on two occasions beats, at Nice, the world's record for height in an aeroplane. Each competitor may only make one record in each year between November 15th and May 15th, and if the prize has not been won by January 1st, 1915, it will then lapse.

A Carnegie Prize.

FROM New York it is announced that Mr. Andrew Carnegie has offered a sum of £5,000 for the first pupil of the Carnegie School of Technology at Pittsburg, who constructs an aeroplane with which satisfactory results are obtained.

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The Shutte Dirigible.

THE wooden framework of the dirigible which is being built at Reinan by Professor Shutte, of Dantzig, is now finished. It will be remembered that this vessel is on similar lines to the Zeppelin, except that the framework is of wood in place of aluminium. It is 138 metres in length and 17 metres in diameter, and will have eleven ballonettes, as in the Zeppelin. It will be fitted with twin screws driven by a 40-60-h.p. motor.

German Airship Manœuvres.

IT has been decided that the day and night manœuvres with German military airships will take place at Metz during the second fortnight of the present month. The three dirigibles selected to take part are "Zeppelin I," "Gross II," and Parseval II," and the manœuvres will be carried out under the general direction of Capt. von Zena.

Mishap with "Espana."

ON the 23rd ult. an attempt was made to carry out the ten hours' night trip with the "Espana," which the Spanish Government require before they will accept the ship. At midnight there was a perfect calm, and preparations were made for an early start. At 3 a.m. everything was ready, and the airship started off with M. Airault in charge, accompanied by Capt. Vivez y Vich, Capt. Kindelan, A. Roussel and Van den Henvel. For some hours everything went well, and the airship cruised above Pau and the environs, but with the dawn a thick fog rose, making it impossible for the aeronauts to see their way, and fearing that the vessel might be driven on to the Pyrenees, it was decided to land. In carrying out this manœuvre the car came in contact with the tree-tops, causing some damage, and the ballonettes also suffered from a similar cause. It eventually came down at Lambeye, about 20 kiloms. from its shed, and under these circumstances M. Airault deemed it prudent to deflate the balloon and have it sent back to Pau by road. The damage, however, was not serious and was repaired in a couple of days.

CORRESPONDENCE.

* * The name and address of the writer (not necessarily for publication) MUST in all cases accompany letters intended for insertion, or containing queries.

Correspondents asking questions relating to articles which they have read in FLIGHT, would much facilitate our work of reference by giving the number of the letter.

NOTE.—Owing to the great mass of valuable and interesting correspondence which we receive, immediate publication is impossible, but each letter will appear practically in sequence and at the earliest possible moment.

THE BLÉRIOT FLYER.

[386] I have in construction a model of the Blériot monoplane, "No. 11." There are one or two points in your scale drawings of the machine which do not seem quite clear to me, and I should be very much obliged if you would give me a sketch of the same.

(1) How are both the rudder and elevator fixed and operated?

(2) In what way is the small wheel fixed, which supports the back part of the main frame when on the ground?

I must also add that FLIGHT, of which I am a regular contributor, has helped me a very great deal with the models which I have made. Bootham.

FRED. W. BRAMLEY.

[The points raised in the above letter being of very general interest are answered by an illustrated article that appears elsewhere. The article is entitled "Further Details of the Blériot Cross-Channel Flyer."—ED.]

AERONAUTICS FOR THE NAVY.

[387] Engineer-Lieut. Gush raises some most valuable objections in his letter (361) to FLIGHT with reference to the suggestions in my article, but I think these difficulties could be minimised by commencing the experiments on tenders to a fleet and not from the actual battleships themselves. The speed of a ship is so constant that I do not think an aeroplane would have much difficulty in coming up to and then reducing its speed to suit the moment of boarding. I am very glad to observe that in spite of all the difficulties raised by Mr. Gush he agrees that special ships could be constructed for the launching and return of aeroplanes, because once the value of the aeroplane was proved from any vessel it would be adopted for a fleet even if it required a special ship. Its application to present vessels is difficult I admit, but few valuable munitions of war have been attained without difficulty. Mr. R. W. A. Brewer only joins issue with me on the question of biplane versus monoplane, and I think I should be going beyond the scope of the article if I went into the respective merits of these two types of machines. I must therefore be content in reply to this correspondent to observe that a biplane, forming as it does its own girder with stays and struts within itself, can be made stronger than a single surface of similar area and weight.

Engelberg.

GRIFFITH BREWER.

A 9-FT. BLÉRIOT MODEL.

[388] Enclosed you will find two photographs of a working model monoplane, very similar to the Blériot type. It has a span of 9 ft., and length over all 7 ft. 6 ins. The planes are double surfaced, air-chamber 1 in. in middle; waterproofed fabric being used, and glued on and well stretched. The engine is a 1½-h.p. "Kingdom," air-cooled. Propeller my own design, being steel, and the blades may be set at any angle. When photographed the tail was not finished, only being covered with paper. There are several original ideas on my machine. The propeller, shock-absorbers, and tilting of the main planes to any angle. I have no available space to try it, though it goes very well on the road, the L.C.C.

refusing me permission to take it on Hampstead Heath. There is no encouragement given to anyone who is interested in flying in this country. This machine was built entirely by me in my spare hours. If you think the photographs good enough to put in your valuable paper, you are at liberty to do so. I see Mr. J. Urquin (349) claims his to be the first model monoplane driven by a petrol motor, so that is the reason I send you photographs of mine. The machine was completed November 1st, 1909.

Hampstead.

C. A. BURKITT.

THE AEROPLANE VERSUS THE DIRIGIBLE.

[389] Your issue of February 26th contains an extremely suggestive and interesting article by Mr. J. Laurence Pritchard, setting forth the advantages and possibilities of the aeroplane v. the dirigible.

Lest it be assumed that I am representing "the other side" I will at once confess myself to be also a firm believer in the "heavier-than-air machine," but since Mr. Pritchard invites correspondence on the subject, I beg leave to mention one or two points in his comparison, which by suitable amendment will make his case both stronger and fairer.

That the aeroplane or some future development of the heavier-than-air machine will eventually attain speeds of 100 miles an hour I do not disbelieve, but such speeds, if desirable, will bring with them the necessity of providing not only protection to the passengers against the enormous wind pressure caused by such rapid motion, but also will necessitate such a material strengthening of the whole structure that it will shift the advantage on that point considerably in the direction of the dirigible.

I do not know upon what ground Mr. Pritchard assumes that it would be possible for the aeroplane to go up to higher regions than the dirigible balloon. I should have thought that the strain of piloting the aeroplane, and especially an aeroplane travelling at such tremendous speed, would prevent the aviator going up to such a height in which the comparative rarefaction of the air would very strongly tax his endurance.

Unless there be a radical change in the type of the heavier-than-air machine from its present prototype, the dirigible balloon will always control a vast portion of the aerial traffic.

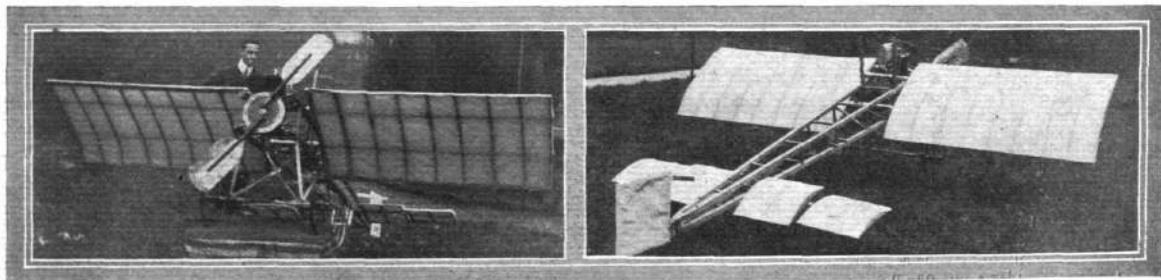
Unlike the aeroplane, which depends for its stability and powers of flight on speed alone, the dirigible balloon can slow down, can travel at moderate speeds, and can hover, and it will, therefore, always retain its superiority over the aeroplane for observation and military purposes, and I believe that it will eventually be much patronised by the public as an ideal mode of travelling.

There is no denying the fact that the travelling public will derive a great deal of comfort from the thought that should the motor stop or work unsatisfactorily—as is the way at present with motors—there is something to "hang on to."

I readily concede that the development of the aeroplane, as compared with that of the dirigible, has been much more rapid and important, but I do not agree with Mr. Pritchard that the dirigible has come to stop—where it is now.

The cost of the former being so much lower than that of even a small dirigible, it is natural that the development of the latter has been taken in hand by very few private individuals, and has been almost exclusively brought about by the various Governments.

Public funds cannot be applied with the same ease as private funds, and therefore experiments cannot be undertaken to anything like the extent and progress made with the same rapidity that is possible with private initiative; but I believe that the time is near



Mr. C. A. Burkitt's working model aeroplane.

at hand when the possibilities of developing aerial travelling as a means of profitable investment will be recognised by several keen business corporations, and then the development of the dirigible will indeed be rapid and complete.

Mortimer Street, W.

A. W. ISENTHAL.

[390] In the interesting article by Mr. L. Pritchard, I notice that one large Wright machine is proposed as an adversary for a dirigible. I think, however, that it would be useful to point out the immense difficulties with which the working of such an apparatus would be attended.

Let us suppose that constructional difficulties have been overcome and that the immense aeroplane has been completed, the first problem which presents itself is how to launch the machine. It would be necessary (at least in the case of a Wright) to have a large flat plain in order that the tips of the wings might not catch, an event which would be caused by the slightest variation from the horizontal before the machine had reached a certain height. And who can be assured that a slight gust of wind will not cause such an inclination at the critical moment? These considerations also apply to descent.

And, when the machine is safely in the air, it is not difficult to imagine that unexpected difficulties in the management of the huge surfaces will be encountered, besides the fact that, in case of breakdown, a landing would be almost impossible, and an attempt to rise again utterly so.

But to compensate all these disadvantages what would be the merits of the giant aeroplane? They would be few, if any, for it would still possess the defects of the ordinary aeroplane, that is to say, slowness in rising and incapability of remaining still in the air. Its 7,800 sq. ft. would present a broad target to a dirigible which, rising swiftly by throwing out ballast, would be able to attack the heavier-than-air machine at its ease. And again, whereas the occupants of the Wright might score several shots without doing irreparable damage to their enemy, a single shot from the Zeppelin, striking either the motors or one of the important spars or uprights, or worst of all damaging the elevator-outrigger, would probably cause the total collapse of the biplane, or at least make an immediate landing necessary. In the same way, with regard to land forces or towns, a large aeroplane, while still labouring under the well-known disadvantages of its smaller brothers, would also present a target almost equal to that of a dirigible.

Thus far the advantage rests with the Zeppelin, but if an ordinary sized aeroplane, in the hands of a Paulhan or a Latham, was told off to circle over the proposed path of an enemy's dirigible, it would be easy for the pilot to swoop down and "prick the bubble" of his opponent.

Hence I think that, if dirigible balloons are to be met in their own element by heavier-than-air machines, it is not by a single large aeroplane but by numerous small machines—of which ten might be produced for the cost of one dirigible—that success is to be attained.

H. D'ERLANGER.

THE "MAYFLY."

[391] I should like to thank Mr. Bath (378) for his instructions on bending bamboo. I will try his method of filling up with sand the next time I have to bend any. A few days after my letter (263) appeared in FLIGHT the Twining Aeroplane Company very courteously wrote me instructions, with a sketch of their method of bending with a spirit lamp. I got the curves easily, but it certainly made the bamboo brittle, and the wet sand method would, I imagine, be easier and more satisfactory to work. The "Mayfly" has not been out for some time. I am greatly handicapped for want of assistants, as the men who help me have their own work and cannot always come when there is a suitable wind, which is very trying to one's patience. The last time she was out she soared very well. I had on vertical curtains, but found they made her drift right across the field, so I took them off again. She was up about 20 mins. in a wind of 10 m.p.h., and we then started her down the hill, and she did a slow glide of 190 yards, and as she soared up 50 ft. she holds the height and distance record for Ireland; but as a matter of fact I don't like to let her go so high, as she always takes a man or two up with her on the end of the ropes. On this occasion one dropped off, my rope went too, and she was held by one rope on the left corner. She is wonderfully steady in side gusts, which may be owing to the arching of main-spars, which are like a gull's wing at the tips. I see the Wrights gave up trying to soar, as the men could not hold their machine; but if I could only get enough men, and teach them to play the aeroplane on the ropes as one would, for instance, play a salmon on a trout rod, soaring would be one of the best ways of practising. The machine is very well balanced, which is purely a matter of luck, but I suppose the balance of a

machine is only found by trial, as no one seems to know anything about it, and the practical people say the scientific theory people are all wrong.

LILIAN E. BLAND.

THE FERGUSON AEROPLANE.

[392] With reference to the interesting yet rather disconnected letter from Mr. Harry G. Ferguson, of Belfast, re his machine (in contradistinction to Blériot's), in view of my contemplating building a machine, I would like to ask a few questions.

How is it that if (according to Mr. Lanchester) the h.p. required to drive his machine should be 25 that Mr. Ferguson uses 35?

And, if the foregoing is correct, how is it that, with a surplus power of 30 per cent., Mr. Ferguson has had to try a dozen propellers before he has even attained a small measure of success?

Perhaps the answer to these questions is that the engine used by Mr. Ferguson only develops 24½ h.p.

I cannot understand Mr. Ferguson's sweeping condemnation of such well-known propellers as the Chauvière, Beedle, and even the Cochrane, to whom, according to himself, he is indebted for leaving *terra firma*.

For the benefit of future builders of machines, it is worthy of note that, according to Mr. Ferguson, all the above propellers are tarred with the one brush, i.e., they are "poor type propellers."

In conclusion, may I respectfully ask Mr. Ferguson if it would be necessary, in the event of my building a machine, to experiment with a dozen propellers and two pairs of wings?

Hoping you will forgive me for taking up so much of your valuable space.

PROPELLER.

[393] I see that Mr. Ferguson has written about his monoplane that he has advertised so much. I think it is rather hard on the various makers of propellers that he should have attributed so many failures to them. The only performance of the machine so far has been a glide, which was duly recorded as an historical flight. I have seen the machine, and I doubt very much if it is the fault of the propellers that it does not fly.

HUMBLE BEE.

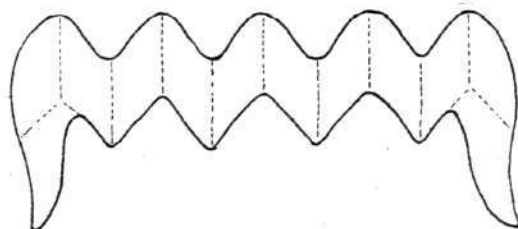
[394] Mr. Ferguson appears to us to be somewhat sweeping in his statements about propellers in his recent letter, where he states that he tried twelve and they were none of them any good. I do not know how many propellers Mr. Ferguson may have tried altogether, but I may say quite frankly that one of the propellers that he did try was a Cochrane, and according to Mr. Ferguson's own statement in the public press, he succeeded in getting his machine off the ground with it in a seven yards run. Such a performance appears to me to be eminently satisfactory, and it apparently was so to Mr. Ferguson himself, so that it is a little difficult to reconcile his present attitude with his previous statement.

I should be sorry to suggest that Mr. Ferguson's apparent contradictoriness is the outcome of anything more than pure Irish excitement, but at the same time I should like to take exception to its unfair aspect, which quite possibly applies to other of the makers of the "unsatisfactory twelve" beside myself. I feel sure, judging by Mr. Ferguson's own description of his methods, that he will find his machine flies equally well, if not better, with a Cochrane propeller when he has finally succeeded in making it fly at all.

COCHRANE AND CO.

SERRATED CUTTING EDGE.

[395] I should like to suggest the use of supporting surfaces designed with the plan form shown in the accompanying sketch, on the ground that they would reduce overall length and minimise the



edge resistance. I also think that they would not be so easily affected by slight variations in the centre of pressure, and if properly constructed they should be stronger and more flexible. The fore and aft section would be cambered, as usual.

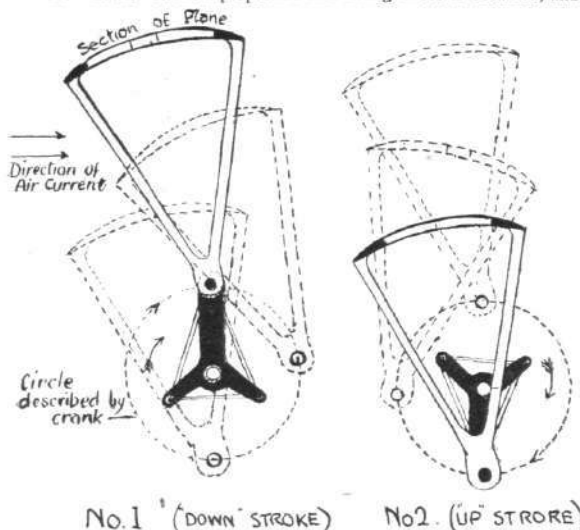
Oldham.

W. P. DEAN.

MODEL TANDEM MONOPLANE.

[396] I think that these particulars of my patented design of tandem monoplane would be of interest to some, at any rate, of your readers.

In addition to the two sets of planes, placed one behind the other, usual in a tandem monoplane, there are a pair of "planes" that are so arranged and pivoted as to be capable of an up and down motion when actuated by connecting-rods attached to cranks. By means of the "down" stroke a propulsive and lifting effect is obtained, and



in the "up" stroke the planes give a lifting effect alone. This is fully shown in the enclosed sketches, No. 1 dealing with the down stroke and No. 2 with the up stroke.

The reason I adopted a moving set of planes was that the "width" of air acted upon horizontally by the machine to produce the propulsive and lifting effect is greatly increased, and is comparatively more efficient than producing a higher velocity of a smaller air column by means of a propeller. A machine so constructed also appears much more stable.

Another novel feature of the design is the shape of the planes. They are of the shape of a dragon-fly's wing. The reason for adopting this was to throw the point of greatest lift (and also of resistance) some distance to either side of the body or hull, also to allow for a variation of the angle of incidence of the planes without shifting the centre of gravity to any great extent. The pair of moving planes are placed between two sets of fixed planes, so that the air delivered by the moving planes increases the lifting effect of the rear pair of planes. The driving arrangements for the moving planes are very simple, and consist of a friction-clutch of peculiar design and gearing. There is a main shaft, constructed of steel tubing, running on ball bearings, which drives direct two propellers, one ahead and one astern of the machine. On the shaft a friction-clutch is keyed, and by means of gearing drives a countershaft at right angles to it. At the ends of this countershaft are placed the cranks that drive the moving planes.

The construction is so simple as to commend itself to any engineer, and is mechanically strong. The friction-clutch is operated by means of a lever. The planes, 1, 2, 3, 4, Sketch 3, are capable of angular movement by means of levers and connecting-rods, which are brought back to immediately behind the engine, where they are actuated by means of small worm-gears. Steering to right or left is effected by varying unequally the angles of these sets of planes. The effect is this: that the point of greatest resistance (due to shape of plane) lies some distance outside the hull, thus, when this tendency is not counterbalanced by the opposite plane, tending to swing the whole machine round that point, also as the angle of incidence of all the planes can be varied there is a great facility for speed variation and also for elevating purposes.

The advantages of this type of machine are:—

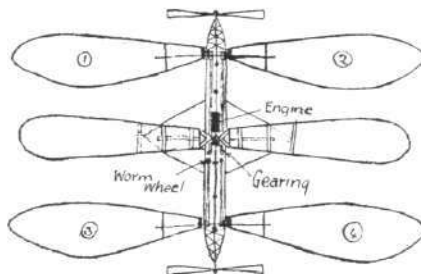
1. No side currents to produce instability at low speeds. 2. Great ease in steering. 3. Greatly increased stability, due to the balancing of every part on either side of the centre of gravity.

I have constructed several models, and find that all my expectations were justified. The planes are set at a slight dihedral angle. If any reader would like to join with me to construct a full-sized machine on these lines I shall be pleased to hear from him.

INVENTOR.

THE NEW ARMY DIRIGIBLE.

[397] I beg to bring to your notice the fact that in your report upon the "New Army Dirigible," in your issue of February 19th, you state "the axis of the propeller-shaft so arranged that it can be adjusted to any inclination to enable the propellers to assist in elevating the airship or *vice versa*," is a new idea in a dirigible. I may mention that this system has been protected by patents, and used upon two complete dirigibles and three "nacelles" (for



No. 3. PLAN.

dirigibles) which have been constructed at my Cardiff works during the last five years.

I shall esteem it a favour if you will give due publicity to this through the columns of your valuable paper.

E. T. WILLOWS.

VOISIN BIPLANE STABILITY.

[398] Could any of your correspondents explain with a diagram how the Voisin biplane maintains lateral stability by means of its vertical partitions or curtains, and if this system is efficient; for it is, as it is perfectly automatic, why is it not more generally adopted?

Petersfield, Hants.

H. D. SEDGWICK.

THE SANDERS AEROPLANE—A CORRECTION.

[399] We have no wish to detract from any credit due to Messrs. J. W. Brooke and Co., Ltd., of Lowestoft, in the matter of the engineering work done by them, or of the motor which they supplied, in connection with the above machine, which unfortunately came to grief last week in attempting to carry away some telephone wires at Kessingland whilst in flight. But for the sake of historic accuracy we must contradict the statement that she was built in conjunction with Messrs. Brooke and Co.

She was built by and to the design of Capt. Sanders, of Croydon, and under the supervision of that pioneer of aviation, Mr. F. L. Rawson, M.I.E.E., A.M.I.C.E., the eminent consulting engineer, of 56, Moorgate Street, London, to whom the model was first submitted. Many of your readers will remember Mr. Rawson in connection with the Barton-Rawson airship of a dozen years ago, and will not be surprised to learn that, as the result of Capt. Sanders having such valuable advice, quite a number of valuable contributions to the science of aviation have resulted from the experiments carried out. We had hoped to have exhibited the full-sized machine at the forthcoming show at Olympia, but the fates decreed otherwise. However, we shall have several valuable inventions there which we trust will not only show our foreign friends that we are very much alive, but also encourage other Britishers who, like ourselves, are plodding along, determined not to be beaten.

THE LONDON AEROPLANE CO.,

HAYTON SANDERS, Managing Director.

23, Blenheim Park Road, Croydon.

SOME OTHER ANSWERS AND QUERIES.

Answers.

Whalebone Strips (365).—The Rev. Harold Kelk states that imitation whalebone for model rib making can be obtained in bundles of 1 dozen, 16 ins. long, at 1s. from Messrs. Holliday, Warwick House, New Street, Birmingham.

Geared Elastic Motor and Landing Chassis (R. A. Cooksey).—Messrs. Fox Brothers, of 15A, Belmont Grove, Chiswick, write that they are making a speciality of this type of motive power. They mention that for a model Antoinette, 1 in. to 1 ft. scale, they would recommend their 30-in. motor, with central two to one gear wheels, entirely enclosed, and running in leak proof oil bath, fitted with a 12-in. aluminium propeller, cast from the solid, worked up by hand and highly polished. Besides the steel gear wheels and elastic, the entire apparatus is built of aluminium and magnalium.

Index and Title-Page for Vol. I.

IN spite of the fact that a very large edition of the index and title-page to Vol. I of FLIGHT was prepared, it proved to be quite inadequate to meet the enormous demand, and hence the delay in responding to the later applications for it. A second large edition is now ready, and copies are being sent off at once.

"Flight" at Olympia.

VISITORS to the Olympia Exhibition, which opens on Friday next, the 11th inst., will find FLIGHT located at the same stand as last year, against the main entrance in Addison Road, although, owing to a re-arrangement of numbers, the stand number will be 6 instead of 1.

Immediately after the last skater left the rink on Monday evening an army of workmen entered the vast building, and by noon the next day had got everything cleared ready for the re-arrangement of the building for the forthcoming Exhibition.

POINTS TO NOTE.

IF further evidence is required of the popularity of Continental aeroplane fabric with expert aviators, the result of the Heliopolis meeting should surely provide it. Every event was won by machines fitted with Continental fabric, and the same applies to second places also. Prizes to the value of over 168,000 frs. were gained by aeroplanes fitted with Continental fabric, while 4,500 frs. went to users of other material.

In connection with the Olympia Show, Messrs. Joseph C. Mount and Co. write to point out that they have recently increased their facilities with regard to the transport and storing of aeroplanes. A large number of machines have been entrusted to their care for transmission to and from the Show.

MESSRS. EYQUEM'S PATENTS inform us that they are now agents for the British market for the Zenith carburettor, which has already established a reputation for itself among aviators. It is fitted to E.N.V. and Vivinus engines, and being made of aluminium is of light weight, and specially suited for such work.

THE catalogue issued by the Twining Aeroplane Co. is a very comprehensive little publication, and sets forth very clearly particulars of the specialities made and supplied by this firm, both with regard to models and also full-sized machines and motors.

PUBLICATIONS RECEIVED.

Modeles d'Aeroplanes. By Adrien Fleux. Paris: *L'Aviation Illustrée*, 5, Rue Coetlogon. Price 2 frs.

Catalogue.

Crankshafts for Aeroplane Engines. Ambrose Shardlow and Co., Ltd., Attercliffe, Sheffield.

NEW COMPANIES REGISTERED.

Aviation Courses, Ltd., 32, Regent Street, S.W.—Capital £2,000, in 1,500 10 per cent. pref. shares of £1 and 10,000 ordinary shares of 1s.

Bristol Aeroplane Co., Ltd., Clare Street House, Bristol.—Capital £100, in £1 shares.

Bristol Aviation Co., Ltd., Clare Street House, Bristol.—Capital £100, in £1 shares.

British and Colonial Aeroplane Co., Ltd., Clare Street House, Bristol.—Capital £25,000, in £1 shares. Directors, Sir George White, Bart. (10,000 shares), Samuel White (10,000 shares), and G. Stanley White (2,500 shares). Secretary, H. White Smith (1,250 shares). Manager, Sydney S. Smith (1,250 shares).

British and Colonial Aviation Co., Ltd., Clare Street House, Bristol.—Capital £100, in £1 shares.

Callaway Co., Ltd., Gwydwr Chambers, 104, High Holborn, W.C.—Capital £1,000, in £1 shares. Aerial machine manufacturers, &c.

Huntingdon Aviation Course, Ltd., 32, Regent Street, S.W.—Capital £12,000, in £1 shares (10,000 participating pref.).

Lane's British Aeroplanes, Ltd.—Capital £10,000, in £1 shares. Formed to acquire the business of an aeroplane manufacturer carried on by C. G. Lane at 31, Foley Street, Great Portland Street, and King's Place, King Street, Camden Town, London.

Motorplanes, Ltd., Gathurst, near Wigan.—Capital £250, in £1 shares.

DIARY OF FORTHCOMING EVENTS.

British Events.

1910.	Flight Exhibition at Olympia.	at	1910.	Flight Meeting, place not fixed.
Mar. 11-19	Bournemouth		Aug. 6-13	
July 11-17	Meeting.	Flight		

Foreign Events.

1910.		1910.	
April 2-10	Biarritz.	July 14-24	Rheims to Brussels, cross country event.
April 3-10	Cannes.	July 24-Aug. 10	Belgium.
April 10-25	Nice.	Aug. 25-Sept. 4	Deauville.
May 10-16	Berlin.	Sept. 8-18	Bordeaux.
May 14-22	Lyons.	Sept. 24-Oct. 3	Milan.
May 20-30	Verona.	Oct. 18-25	America. Gordon-Bennett Balloon Race.
June 5-12	Vichy.	Oct. 25-Nov. 2	America. Gordon-Bennett Aeroplane Race.
June 5-15	Budapest.		
June 18-24	St. Petersburg.		
June 26-July 10	Rheims.		

Aeronautical Patents Published.

Applied for in 1909.

Published March 3rd, 1910.

10,154.	J. POND.	Flying machines.
15,422.	E. R. G. DYBERG.	Flying machines.
16,459.	R. ALEXANDER-KATZ.	Shelters for airships.
19,208.	L. BLÉRIOT.	Aeroplanes.
29,513.	R. WAGNER.	Counter propellers for airships, aeroplanes, &c.

BACK NUMBERS OF "FLIGHT."

SEVERAL back numbers are now very scarce, and have been raised in price as follows:—

No.	2, Jan. 9,	containing	Table of Propellers ...	1 6
3	" 16	"	" Engines ...	3 0
4	" 23	"	Engines at Paris Salon ...	3 6
6, Feb. 6	"	"	"How Men Fly" ...	1 0
			Aeronautical Bibliography.	
8	" 20	"	Wright Bros.' Elevator Patents.	
			Flying Ground at Farnbridge ...	1 0
10, Mar. 6	"	"	Illustrated Glossary.	
			Human Side of Flying ...	1 0
			Aero Club Ground at Shellbeach.	
			Military Aeronautics.	
12	" 20	"	Souvenir Supplement ...	1 6
15, Apr. 10	"	"	Engines at Olympia ...	1 0
16	" 17	"	Prize List ...	3 6
			Models at Olympia.	
31, July 31	"	"	Blériot Flyer ...	2 0
			(Full page drawing.)	

Other back numbers, post free, 1s. 6d. each (including descriptions and scale drawings of the Voisin, Curtiss, Cody and Farman biplanes, the Santos Dumont, Antoinette, and Grade monoplanes, and of a full-size Wright glider.

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